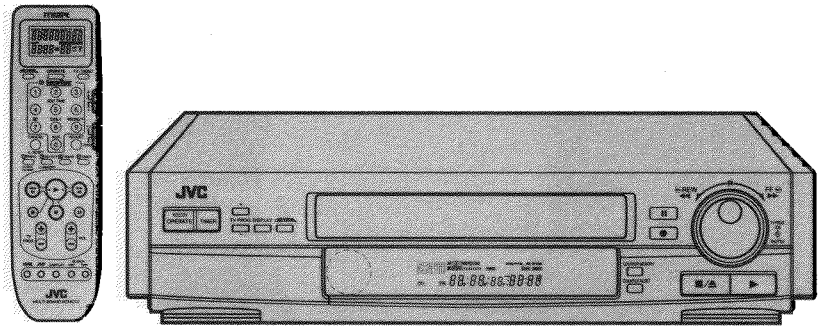
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-E226EG/J220E/J221E



SHOWVIEW

VHS PAL

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-E226EG)*

GENERAL

Power requirement	: AC 220 – 240 V~, 50/60 Hz
Power consumption	: 20 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Dimensions (WxHxD)	: 426 x 94 x 341 mm
Weight	: 4.5 kg
Format	: VHS PAL standard
Maximum recording time	: 240 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording/Playback system	: Rotary two-head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: 21-pin scart connector x 2 (IN/OUT x 1, IN/DECODER x 1) RCA connectors (VIDEO IN x 1, AUDIO IN x 1)

TUNER/TIMER

TV channel storage capacity	: 80 positions (+AUX position "AU")
Channel coverage	: VHF 47 – 89/104 – 300/ 302 – 470 MHz UHF 470 – 862 MHz
Aerial output	: UHF channel 36 (Adjustable 32 – 40)
Memory backup time	: Approx. 3 min.

ACCESSORIES

Provided accessories	: Aerial cable, Infrared remote control unit, "R6" battery x 2

Design and specifications subject to change without notice.

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April 1995

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The following table lists the differing points between Models (HR-E226EG,HR-J220E and HR-J221E) in this series.

	HR-E226EG	HR-J220E	HR-J221E
SIDE PANEL	○	×	×
JOG/SHUTTLE SWITCH	○	×	×
FRONT A/V INPUT TERMINAL	○	×	×
AV2 CONNECTOR	○	×	○

Note: ○:USED ×:NOT USED

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

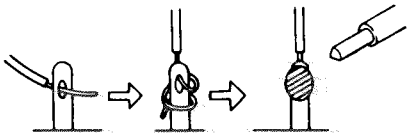

Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

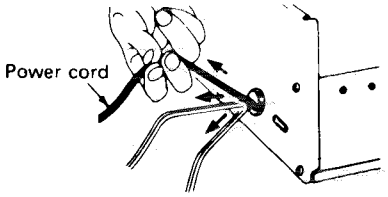

Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

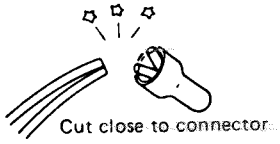

Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

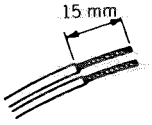

Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

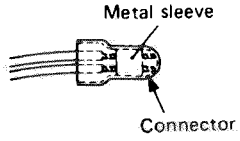

Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

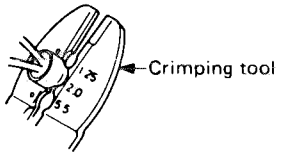

Fig. 6

(5) Check the four points noted in Fig. 7.

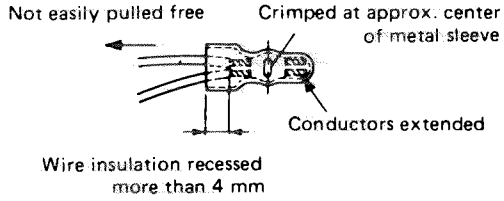
Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

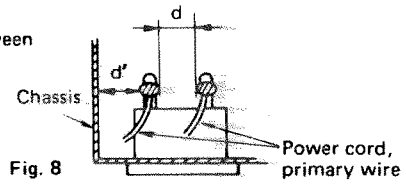

Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

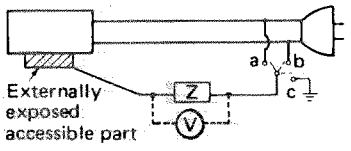

Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

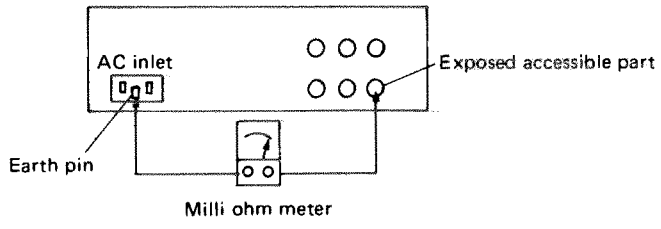

Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	—	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS

Safety Precautions

The rating plate and the safety caution are on the rear of the unit.

WARNING: DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

The OPERATE button does not completely shut off mains power from the unit, but switches operating current on and off.

CAUTION
- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

WARNING
There are two different types of SECAM colour systems: SECAM-L, used in FRANCE (also called SECAM-West), and SECAM-B, used in Eastern European countries (also called SECAM-East).
1. This recorder can also receive SECAM-B colour television signals for recording and playback.
2. Recordings made of SECAM-B television signals produce monochrome pictures if played back on a video recorder of SECAM-L standard, or do not produce normal colour pictures if played back on a PAL video recorder with SECAM-B system incorporated (even if the TV set is SECAM-compatible).
3. SECAM-L prerecorded cassettes or recordings made with a SECAM-L video recorder produce monochrome pictures when played back with this recorder.
4. This recorder cannot be used for the SECAM-L standard. Use a SECAM-L recorder to record SECAM-L signals.

IMPORTANT:
- It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.
- Please read the "Precautions" section of this instruction manual before installing or operating the recorder.

VHS HQ SHOWVIEW

- Only cassettes marked "VHS" can be used with this video recorder.
- HQ VHS is compatible with existing VHS equipment.
- ShowView is a trademark applied for by Gemstar Development Corp. ShowView system is manufactured under licence from Gemstar Development Corporation.

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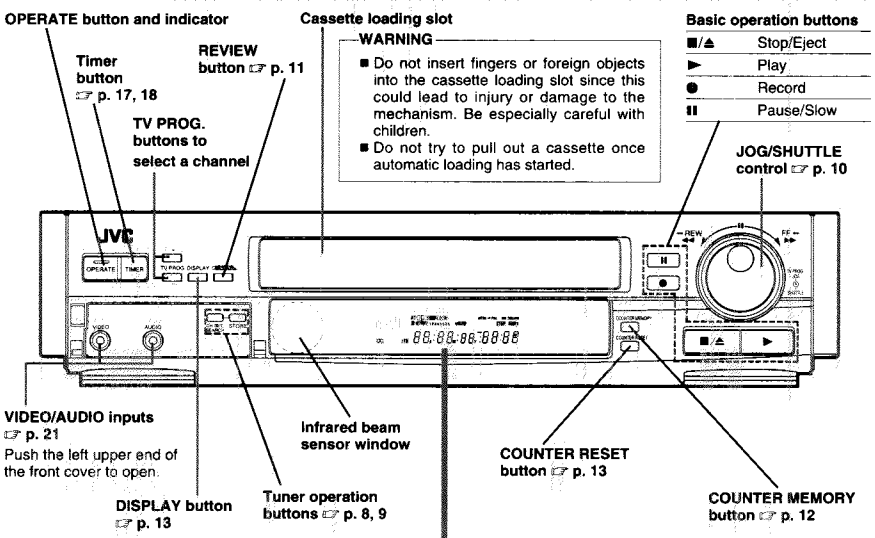
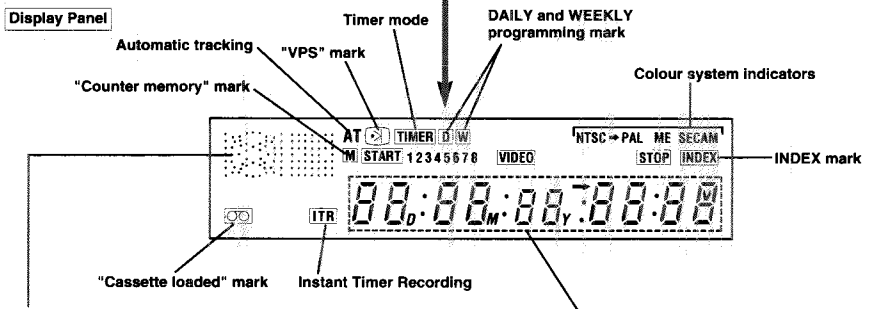
Controls And Indicators

ENGLISH

Front Panel


OPERATE button and indicator
Timer button ☞ p. 17, 18
REVIEW button ☞ p. 11
TV PROG. buttons to select a channel
Cassette loading slot
WARNING
■ Do not insert fingers or foreign objects into the cassette loading slot since this could lead to injury or damage to the mechanism. Be especially careful with children.
■ Do not try to pull out a cassette once automatic loading has started.
Basic operation buttons
■/⏏ Stop/Eject
► Play
● Record
❚❚ Pause/Slow
JOG/SHUTTLE control ☞ p. 10
JVC
VIDEO/AUDIO inputs ☞ p. 21
Push the left upper end of the front cover to open.
DISPLAY button ☞ p. 13
Tuner operation buttons ☞ p. 8, 9
Infrared beam sensor window
COUNTER RESET button ☞ p. 13
COUNTER MEMORY button ☞ p. 12

Display Panel



Symbolic mode indicators

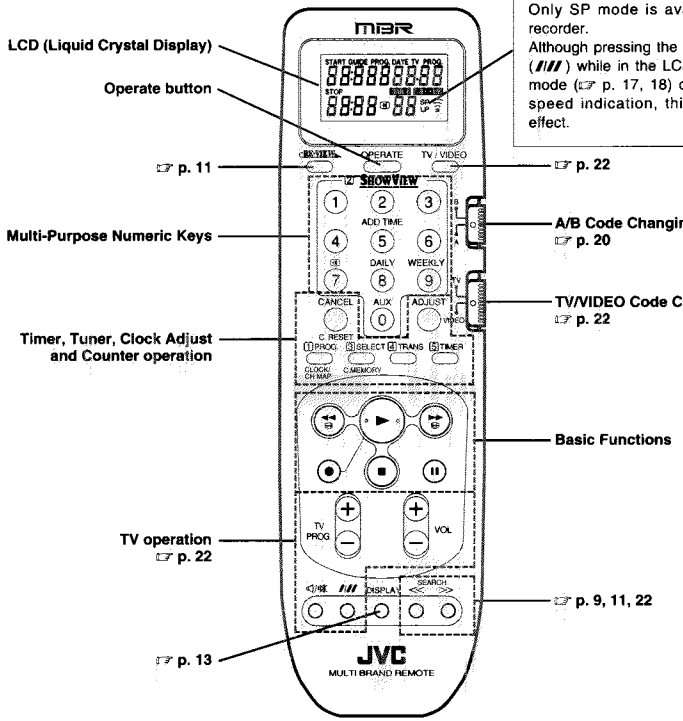
PLAY:	▷	REW VARIABLE SHUTTLE SEARCH:	◁ ◁◁
FF:	▷▷	STILL: FORWARD SLOW:	▷ ▯▯
REW:	◁◁	STILL: REVERSE SLOW:	◁ ▯▯
FF VARIABLE SHUTTLE SEARCH:	▷ ▷▷	RECORD :	○
REVERSE PLAY:	◁	RECORD PAUSE:	○ ▯▯

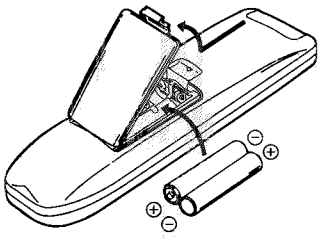
* The indicator will blink during turbo search.

Switchable display
- Channel position
- Date/Clock
- AUX indicator(AU 1, AU 2 or F-AU)
- Child lock indicator
- Timer start/stop time
- Instant timer recording time
- Real channel
- Realtime tape counter
- INDEX code number

Controls And Indicators (cont'd)

Wireless Remote Control





Installing Batteries

1. Open the battery compartment cover.
2. Insert 2 "R6"-size batteries (provided) in the correct directions.
3. Replace the cover.

How To Use

The remote control can operate most of your video recorder's functions, as well as basic functions of TV sets of JVC and other brands. ☞ p. 22.

- Point the remote control toward the sensor window.
- The maximum operating distance of the remote control is about 8 m.

Connections

ENGLISH

It's essential that your video recorder be properly connected. Follow these steps carefully. THESE STEPS MUST BE COMPLETED BEFORE ANY VIDEO OPERATION CAN BE PERFORMED.

A RECORDER-TO-TV CONNECTION

RF CONNECTION

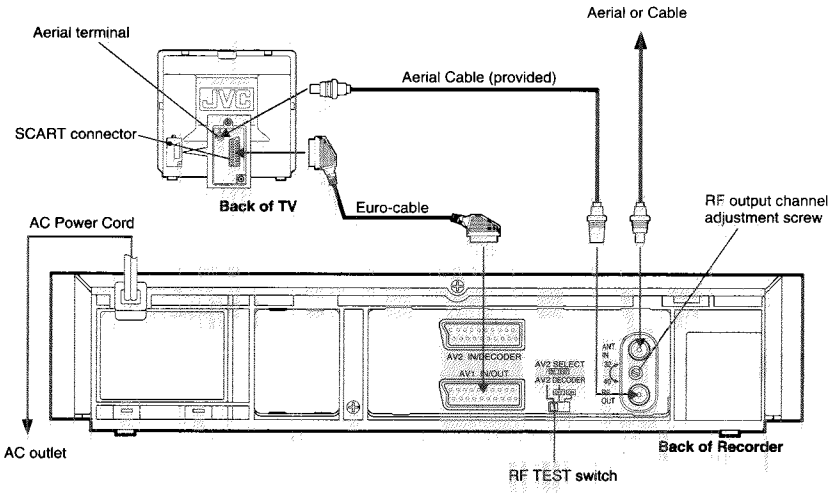
For TV sets without AV input terminals:

1. Connect the TV aerial cable to the recorder.
2. Connect the recorder to the TV's aerial terminal.

AV CONNECTION

For TV sets with AV input terminals:

1. Connect the aerial, recorder and TV as per "RF CONNECTION".
2. Connect the recorder to the TV's 21-pin SCART connector.

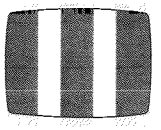


B TUNE THE TV TO YOUR VIDEO RECORDER

The video recorder sends picture and sound signals via the RF connecting cable to your TV on UHF channel 36.

TEST SIGNAL

1. Turn on the recorder.
2. Set the RF TEST switch to ON.
3. Press TV/VIDEO to engage the VIDEO mode.
4. Set your TV to the video channel. Tune the TV to bring the two vertical white bars on the screen most clearly. (UHF/CH 36)
   - Your TV should be set to the channel designated for use with a video recorder or to a spare channel if there is not a specified video channel on your TV.
5. Reset the RF TEST switch to OFF.



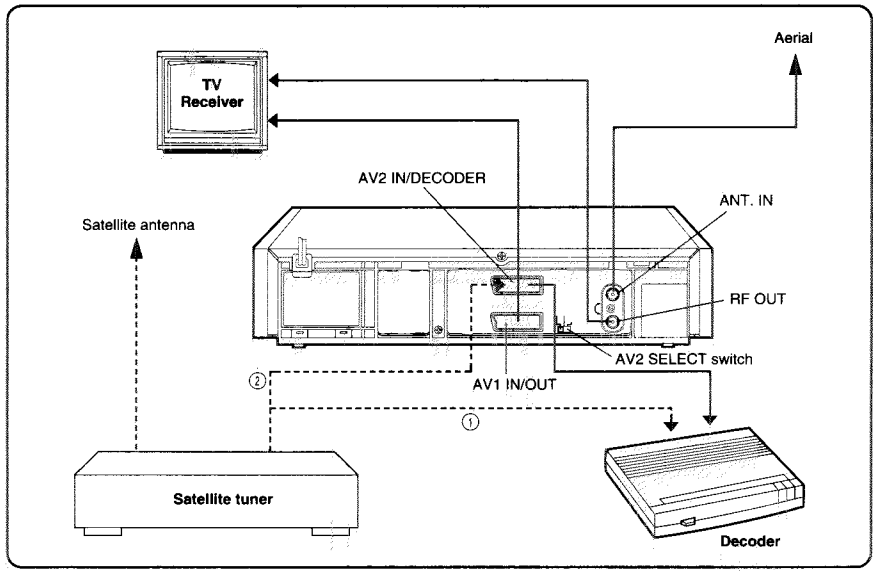
NOTES:

- If CH36 is occupied by a local station, adjust the RF output channel adjustment screw to use another channel between CH32 and CH40 instead.
- If some interference noise is continually seen on the screen, consult your JVC dealer.

IMPORTANT:

To operate the recorder with your TV using the RF connection, it is always necessary to set your TV's channel to the VIDEO channel. With an AV connection, set the TV to the VIDEO (or AV) mode.

Information On Scrambled Broadcasts



SET UP

The AV2 IN/DECODER connector can be used as an input terminal for an external decoder (descrambler). Simply connect a decoder and you can enjoy the variety of programming that is available through scrambled channels.

1. Connect your recorder and TV via their AV connectors (☞ p. 5, AV CONNECTION).
2. Set the AV2 SELECT switch on the recorder's rear panel to "DECODER".
3. Connect your recorder's AV2 IN/DECODER connector to the decoder's Euroconnector using a 21-pin SCART cable.
4. Set the tuner to receive scrambled channels (☞ p. 8, Setting The Tuner).

NOTES:

When connecting a satellite tuner...

- Connect the satellite tuner to the decoder ①, or if you don't have a decoder connect the satellite tuner directly to the vieo recorder ②.
- Set the AV2 SELECT switch on the rear panel to "AV2".
- To view a programme via the satellite tuner, select AU 2 mode by pressing TV PROG. until "AU 2" appears on the display panel.

WATCHING SCRAMBLED CHANNELS

Preparation

- Turn on the TV.
- Select VIDEO channel (or AV mode).

1. Press TV/VIDEO to select the VIDEO mode.
2. Choose a scrambled channel using the Numeric keys or TV PROG. just as you would with regular stations.

Watching One Programme While Recording Another

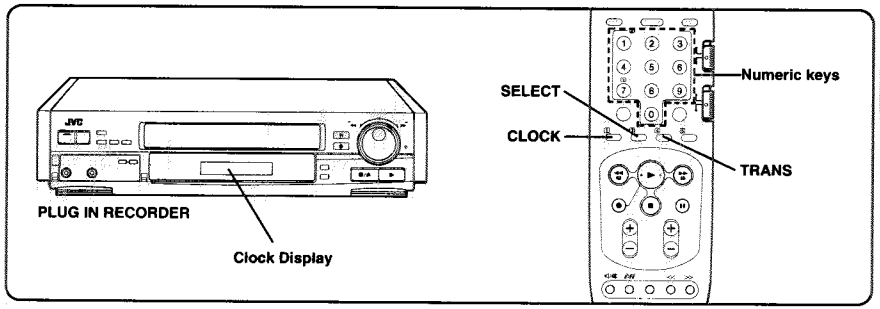
To watch a regular TV programme while recording a scrambled programme:

- Press the TV PROGRAM button on the TV's remote control and select the channel you want to watch.
- To watch the scrambled programme that is being recorded, press TV/VIDEO and select the VIDEO mode.

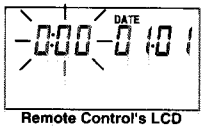
To watch a scrambled TV programme while recording a regular programme:

- Press the TV PROGRAM button on the TV's remote control and select the scrambled channel. After displaying a scrambled picture for a few seconds, the programme will become descrambled and a viewable picture will appear on the TV screen.

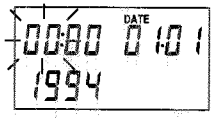
Setting The Clock



1. Load batteries (☞ p. 4).

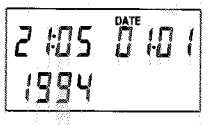


2. Press CLOCK.



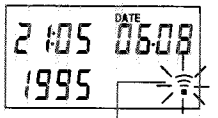
3. Press the appropriate numeric keys to input the time.

- Example: For 21:05, press 2 1 0 5.



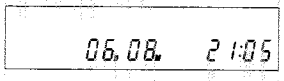
4. Press the appropriate numeric keys to input the day, month and year.

- Example: For 6th August, 1995, press 0 6 0 8 1 9 9 5.



5. Press TRANS with the remote control directed to the recorder's remote sensor window.

- The remote control's clock will start. At the same time, the set data will be transferred to the recorder.



Recorder's Display Panel

TO MAKE CORRECTIONS

Press SELECT button so that the item you want to change blinks. Re-input that item. Continue to step 5.

AFTER A POWER CUT

Since your video recorder has a 3-minute backup memory, it will not be affected by short power cuts. If mains power is unavailable for over 3 minutes, however, the recorder's display will reset to 0:00. In such a case, simply transfer the remote control's time to the recorder.

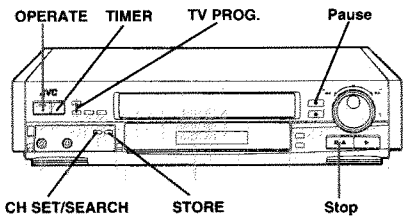
1. Press CLOCK three times.
2. Press TRANS with the remote control directed to the recorder's remote sensor window.

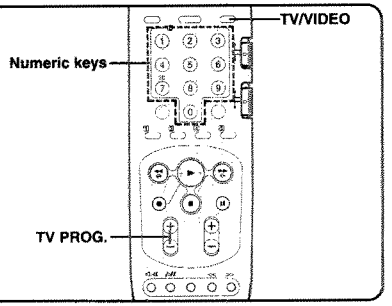
NOTES:

- If the day and month data is invalid (such as 31st April), the month digits are cleared automatically and the day digits will blink. Input again.
- If the year digits are automatically cleared in step 4, it is possible that you have input 29th February for a non-leap year. Input again.
- When the batteries are exhausted, the time display will change to "0:00" and start blinking. Replace all the batteries and set the clock again.

Setting The Tuner

■ Turn on the TV: Select VIDEO channel (or AV mode).
■ When the decoder is connected, switch on the decoder.



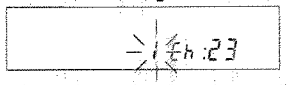


The procedure introduced here lets you assign receivable channels in your area to channel positions on your video recorder's tuner. Once stored, these can be accessed with the TV PROG. buttons.

1. Press OPERATE to turn on the recorder.
2. Press TV/VIDEO to engage the VIDEO mode.
3. Press CH SET/SEARCH until the display panel shows the following.

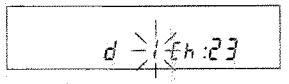
Ch = Regular CC = Cable

4. Press CH SET/SEARCH again briefly to start automatic scanning for receivable channels.



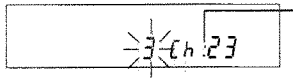
■ Automatic scanning stops when a station is detected, and the channel position will blink.
■ Holding down CH SET/SEARCH will start reverse search.
■ If you don't want to store the station detected, simply press CH SET/SEARCH to continue automatic scanning.

5. Press TV/VIDEO on the remote control when a scrambled broadcast is detected.



■ The programme will be descrambled. For normal (non-scrambled) broadcasts, do not press TV/VIDEO.

6. Press numeric keys or TV PROG. to select the channel position where you wish to store that TV station.



7. Press STORE to store the station.
■ The colon will disappear when the station is stored.

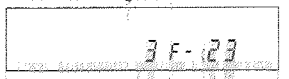
8. Repeat steps 4 through 7 for other receivable channels.
■ If the picture of the detected station is not satisfactory, try fine-tuning. See below.

9. Press Stop on the recorder to disengage the Channel Set mode.

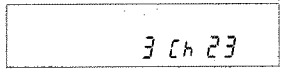
TO GET A CLEARER PICTURE — Fine-Tuning—

After step 8, you can perform Auto Fine-Tuning for all the stored stations at once.

1. Press Pause for more than 2 seconds.
■ Auto Fine-Tuning will start.



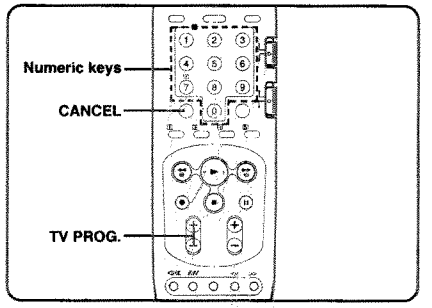
■ After completion of Auto Fine-Tuning for all the stored stations, the display panel will return to step 7.



2. Continue to step 9.

If you want to fine-tune a specified station, try fine-tuning manually.

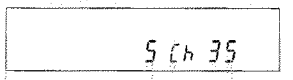
1. Press TV PROG. (+ or –) to select the station you wish to fine-tune.
2. Press Pause briefly.
3. Press TV PROG. (+ or –) so that the picture becomes clearer.
4. Press Pause briefly again.
5. Continue to step 9.



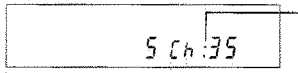
TO DELETE STORED CHANNELS

Please follow the procedure described below when you wish to delete a poorly received channel.

1. Press TV PROG. to select the channel position you want to skip.
2. Press CH SET/SEARCH for more than 2 seconds.



3. Press CANCEL.



■ The colon will appear when the station is deleted. Channel position 5 can no longer be chosen by TV PROG. buttons.

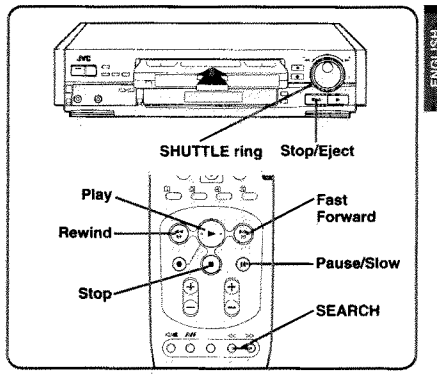
4. Press Stop on the recorder to disengage the Channel Set mode.

TO STORE NEW CHANNELS

Please follow the procedure described below when you wish to add a new channel.

1. Press CH SET/SEARCH for more than 2 seconds.
2. Press TIMER.
■ Real channel starts blinking.
3. Press TIMER to change the band between Ch and CC, if necessary.
4. Press numeric keys to input the number of the real channel you want to store.
5. Press numeric keys to input the number of a vacant channel position.
6. Press STORE to store the channel.
7. Press Stop on the recorder to disengage the Channel Set mode.

Playback



Basic Operations

Preparation
■ Turn on the TV.
■ Select VIDEO channel (or AV mode).

1. Load a cassette.
■ The recorder power will come on automatically.
■ The counter will be reset to "0:00:00" automatically.
■ If the safety tab on the cassette is removed, playback will start automatically.

2. Press Play to start playback.

3. Press Stop to stop playback.
■ To rewind the tape, press Rewind or turn the SHUTTLE to the left and release it.
■ To fast-forward the tape, press Fast Forward or turn the SHUTTLE to the right and release it.
■ To stop rewind or fast-forward, press Stop.

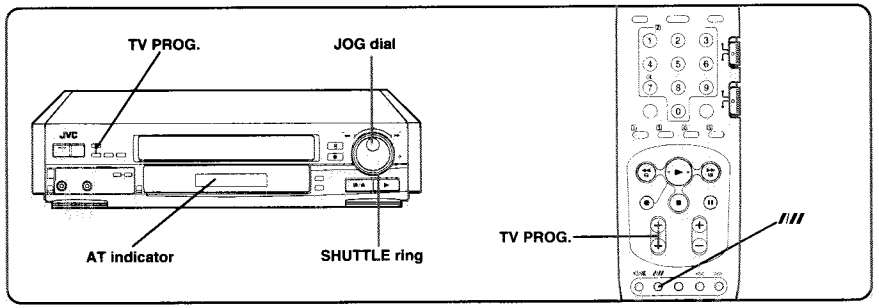
4. Press Stop/Eject on the recorder to eject the tape.

Variable-Speed/High-Speed (Turbo) Search, Still Playback/Frame Advance/Forward Slow Motion

During Playback:
■ Press either SEARCH button for variable-speed search.
■ The more times the button is pressed, the faster the playback picture will move.
■ To decrease speed, press the button for the opposite direction.
■ Press Fast Forward for high-speed forward search, or Rewind for high-speed reverse search.
■ For short searches, keep Fast Forward or Rewind pressed for more than 2 seconds. When released, normal playback will continue.
■ Press Pause/Slow to view a still picture.
■ Press again to advance the picture frame by frame.
■ Press Pause/Slow for 2 seconds for slow motion.

During Still:
■ For frame-by-frame playback in the forward or reverse direction, press SEARCH << or >> in the corresponding direction.

Playback (cont'd)



Other Functions

JOG/SHUTTLE Control

You can view pictures in slow to fast motion, or frame-by-frame.

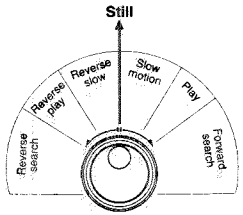
During Playback or Still:

1. Turn the outer ring (SHUTTLE) in either direction. The farther the ring is rotated, the faster the search speed. Releasing the ring stops the picture in the Still mode.
   - For fast-forward with a visible picture, turn the SHUTTLE all the way to the right and release it within 1 second.
   - For rewind with a visible picture, turn the SHUTTLE all the way to the left and release it within 1 second.

During Playback or Still:

1. Turn the inner dial (JOG) clockwise or counterclockwise for jog control. The tape moves frame-by-frame at the speed with which the dial is turned, in the direction the dial is rotated.

To resume normal playback, press Play button.



Manual Tracking

Your video recorder is equipped with automatic tracking control. If you wish to adjust tracking manually, you can override this function.

During Playback:

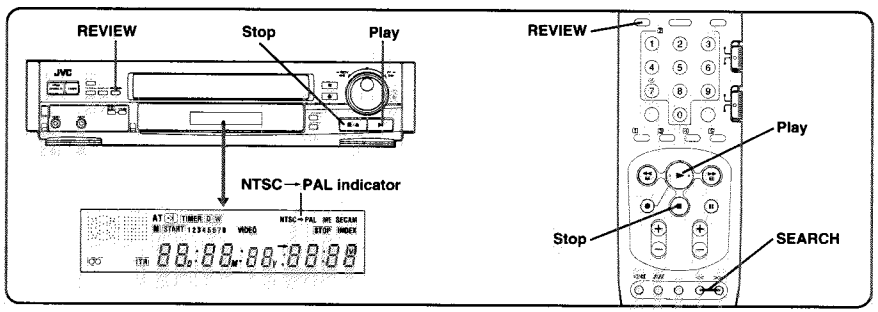
1. Press the recorder's TV PROG. + and – buttons simultaneously.
   - The AT indicator will go out.
2. Press TV PROG. + or – to adjust tracking.
   - Press TV PROG. + and – simultaneously to return to automatic tracking.
   - To adjust tracking manually with the remote control, first press the /// button and then press TV PROG. – or +. Press the /// button again to return to automatic tracking.

During Slow:

1. Simply press TV PROG. + or – to adjust tracking.

NOTES:

- The recorder automatically stops when still continues for more than 5 minutes.
- If the still picture is unstable, use the TV PROG. buttons to correct the picture.
- During search playback, some noise bars will appear.
- There is no audio during search, slow, still, or frame-by-frame playback.
- When a new tape is inserted, the recorder enters the automatic tracking mode automatically.

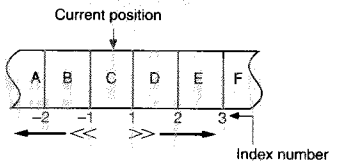


Index Search

Your recorder automatically marks index codes at the beginning of each recording. This function gives you quick access to any one of 9 index codes in either direction.

During Stop:

1. Press SEARCH << or >>. "INDEX –1" or "INDEX 1" will be displayed on the display panel and search will begin in the corresponding direction.
2. If you wish to access index codes 2 through 9, press SEARCH repeatedly until the correct index number is displayed.
   Ex.: To locate the beginning of B from the current position, press SEARCH << twice.
   To locate the beginning of D from the current position, press SEARCH >> once.



- When the specified index code is found, playback will start automatically

ReView Function

Simply by pressing a single button, the recorder power comes on, rewinds, and begins playback of the last recording. This makes it easier to "review" the programme you have timer-recorded.

When the recorder power is off:

Press REVIEW.

- After the racorder power comes on, the tape will be rewound to the beginning of the last recording (where the index code is placed) and playback will start automatically.
- To play back a recording located 2 index codes away, press REVIEW twice. You can access any one of up to 9 index codes.
- ReView is not possible while the recorder is in the Timer mode.
- The recorder's REVIEW button lights when timer-recording is finished, and blinks while the tape is being rewond.

NTSC Playback

Your video recorder is equipped with NTSC circuitry that can play back NTSC tapes.

1. Insert a cassette recorded in NTSC.
2. Press Play.

When playing back NTSC tapes:

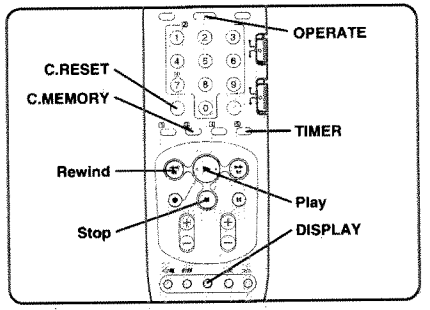
- "NTSC → PAL" will appear on the display panel.
- Some TVs shrink the picture vertically and place black bars at the top and bottom of the screen. This is not a malfunction on the part of either the video recorder or the TV.
- The picture may roll up or down. This can be corrected using the V-HOLD control found on some TVs. (This cannot be corrected if the TV does not have a V-HOLD control.)
- The counter reading will be incorrect.
- During search, still, or frame-by-frame playback, the picture will be distorted, and there may be a loss of colour.

Repeat Playback

During Playback:

1. Press Play for more than 5 seconds, and release.
   - The Play indicator (▷) on the display panel will blink slowly.
   - The tape will be played all the way to the end 20 times automatically, and then stop.
2. To stop playback at any time, press Stop.

Playback (cont'd)



Other Functions (cont'd)

Counter Memory

During Playback:

1. Press DISPLAY until a counter reading appears on the display panel.
2. Press C.RESET at a point you wish to locate later.
   - The counter will read "0:00:00".
3. Press C.MEMORY.
   - The M indicator will light on the display panel.
4. When you wish to return to that point, press Stop and then Rewind.
   - The tape will rewind and stop at about "0:00:00" automatically.
5. To cancel the Counter Memory mode, press C.MEMORY again.

Next Function Memory

Your recorder can memorise what to do after rewind.

During Stop:

For automatic start of playback after the tape is rewound:

1. Press Rewind.
2. Press Play within 2 seconds.

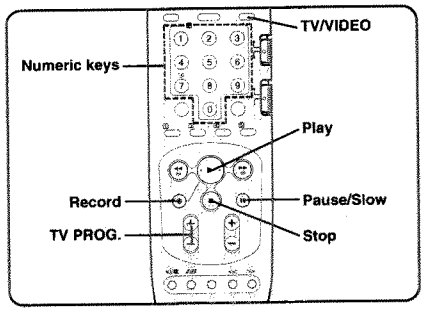
For automatic power off after the tape is rewound:

1. Press Rewind.
2. Press OPERATE within 2 seconds.

For automatic timer standby after the tape is rewound:

1. Press Rewind.
2. Press TIMER within 2 seconds.

Recording



Basic Operations

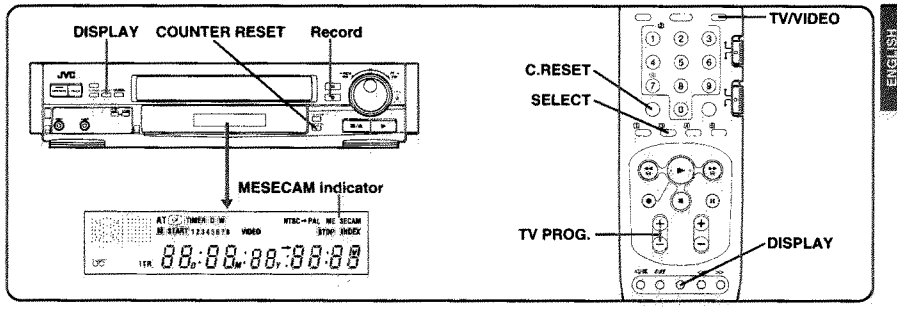
Preparation

- Turn on the TV.
- Select VIDEO channel (or AV mode).

1. **Load a cassette.**
   - The recorder power will come on automatically.
2. **Press TV/VIDEO to engage the VIDEO mode.**
3. **Press TV PROG. or the numeric keys to select the channel you wish to record.**
   - You can also use the recorder's JOG dial to select the channel.
4. **Press Record and Play simultaneously.**
5. **Press Pause/Slow to pause recording.**
6. **Press Play to resume recording.**
7. **Press Stop to stop recording.**

NOTES:

- To start recording with the recorder's Record button, press it once on its own.
- After pause, when recording is resumed, a few frames recorded before the pause may be overlapped by the new recording. This is meant to reduce picture distortion and is not a malfunction.
- The recorder automatically stops when record-pause continues for more than 5 minutes.
- If the Record button does not work, check to see if the cassette's safety tab has been removed.
- The channel cannot be changed while recording is in progress. To change the channel, engage the record-pause mode, then change the channel.
- The recorder automatically rewinds when the end of the tape is reached during recording.
- When a VPS programme is being broadcast on the selected channel, "VPS" mark appears on the display panel. ☞ p. 19 for information on VPS.



Other Functions

To Watch Another Programme While Recording

During Record:

1. If your recorder is connected to the TV via AV connection, press TV/VIDEO.
   - The recorder's VIDEO indicator and the TV broadcast being recorded will disappear.
2. Use the channel controls on the TV to select the other channel you wish to view.
   - The programme selected with the TV channel controls will appear on the TV screen while the one selected with the video recorder's channel controls will be recorded on the tape.
   - If a decoder is connected to the recorder (☞ p. 6), you can select a scrambled channel as well with the TV channel controls.

Instant Timer Recording (Off Timer)

You can start a recording and then set the recorder to shut off automatically after a set duration.

During Record:

1. Press recorder's Record. "ITR" and "0:30" indications appear, advising that power will switch off after 30 minutes.
2. Press Record again to delay the off-time by 30-minute increments (up to 4 hours).
   - For more precise setting, use the remote control's SELECT and TV PROG. buttons to set the exact time required (possible up to 4 hours and 59 minutes).

Elapsed Recording Time Indication

When you need to know the exact time of a recording.

1. Press DISPLAY until a counter reading appears on the display panel.
2. Press C.RESET before starting recording or playback.
   - The counter will be reset to "0:00:00" and show the exact elapsed time as the tape runs.

Display Button

When you wish to check the time, date, or counter reading

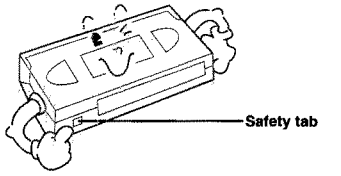
1. Press DISPLAY to display the current clock time.
2. Press DISPLAY again to display the current date.
3. Press DISPLAY again to display the counter reading.

Information on Colour System

- You can also record SECAM signals, or play back a MESECAM tape on this recorder.
- When SECAM signals are being received, "MECECAM" will be displayed on the display panel.
- When a MESECAM tape is played back, "MESECAM" will be displayed on the display panel.
- MESECAM is the designation for tapes with SECAM signals that have been recorded on MESECAM-capable PAL recorder.

Special Note On Video Cassettes

To prevent accidental recording on a recorded cassette, remove its safety tab. To record on it later, cover the hole with adhesive tape.



Preparation for ShowView Timer Programming

What is ShowView?
For timer-recording to take place, information such as the channel, date, start time and stop time of the programme you wish to record, must be programmed into the recorder's timer memory. The ShowView system condenses all this information into a simple ShowView code number.
Since the ShowView number contains information on the channel number, if you live in an area that uses channel numbers that are different from those listed in your TV directory, these "differences" must be input into the remote control. This process is called "Channel Mapping" (CH MAP).

CHECK THE GUIDE PROG. NUMBERS

Preparation
- Make sure you have set the clock. (☞ p. 7)
- Make sure you have set the tuner. (☞ p. 8)
- Get a TV schedule listing (magazine, newspaper, etc.) which carries ShowView code numbers.

A Find out the channel position numbers your recorder tunes to when you use the TV PROG. –/+ buttons (the positions you stored on page 8) and write them into the list.

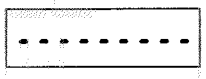
Example: 1, 2, 3, 4, 6, 8, 10, 12

B Look through the TV listing and find out the broadcast station name of each of the channels.

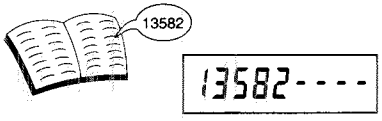
C Use the ShowView numbers to find out the GUIDE PROG. numbers for each of the stations.

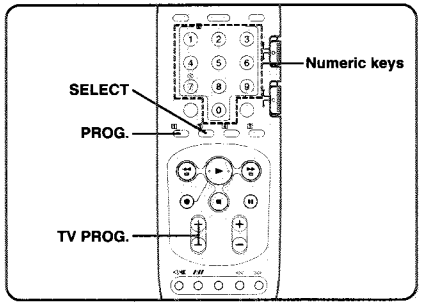
How to check:

1. Press PROG.



2. Press the appropriate numeric keys to enter the ShowView number for a programme as it appears in your TV listing.
- Make sure the ShowView number is for a programme which has not been broadcast yet.





3. Press SELECT.

GUIDE PROG.

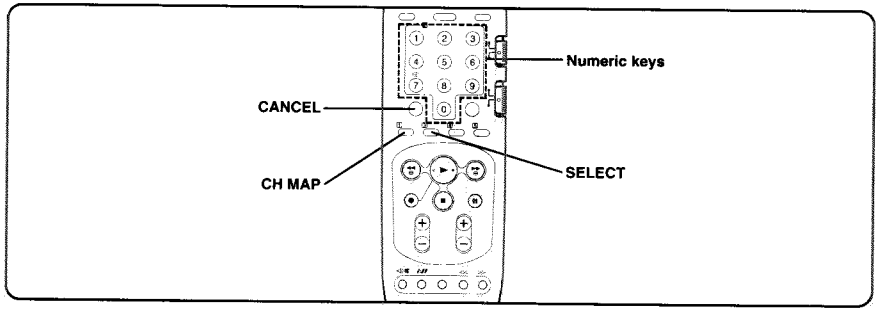
- The number that appears as the channel number is the GUIDE PROG. number for that station. Write it into the list.

ATTENTION
- When you press the SELECT button in step 3, "Err(or)" may appear on the LCD.
  This may mean that...
  - you entered a ShowView number for a programme which has already passed.
  - the GUIDE PROG. number for that station is a 3-digit number.
- For 3-digit GUIDE PROG. numbers, refer to the GUIDE PROG. number list enclosed with this instruction manual or consult your JVC dealer.

4. Press PROG. and display the clock time.
- Repeat steps 1– 4 and check the GUIDE PROG. number for each of the channels your recorder receives.

A Channel on your recorder (TV PROG. number)	B Station name	C GUIDE PROG. number
(ex.) 1	ARD	1
2	ZDF	2
3	WDR	17

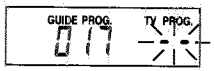
D In cases where the channel number your recorder receives A and the GUIDE PROG. number C for that station do not match, it is necessary to make changes in the remote control's Channel Map. (continued on next page)



INPUT GUIDE PROG. NUMBERS INTO REMOTE

1. **Press CH MAP until the Channel Map display (below) appears in the remote control's LCD.**

2. **Press the appropriate numeric keys to enter the GUIDE PROG. number (C column in your list).**
Ex.: For "1", press
0, 0, 1.
For "10", press
0, 1, 0.



3. **Press the appropriate numeric keys to enter the channel number your recorder receives that station on. (TV PROG. number, A column in your list.)**
Ex.: For "3", press
0, 3.

4. **Press SELECT.**
- To input other channels into the Channel Map, repeat steps 2 – 4 above.

5. **Press CH MAP and display the clock time.**

TO CHECK/CANCEL GUIDE PROG. NUMBERS IN THE REMOTE

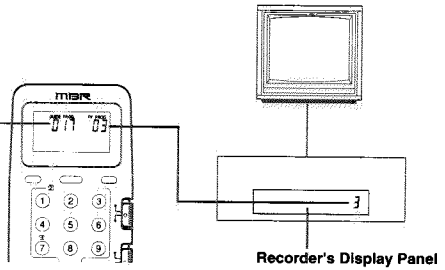
1. Press CH MAP until the Channel Map display (below) appears in the remote control's LCD.

2. Press SELECT until the GUIDE PROG. number you wish to check or cancel is displayed.

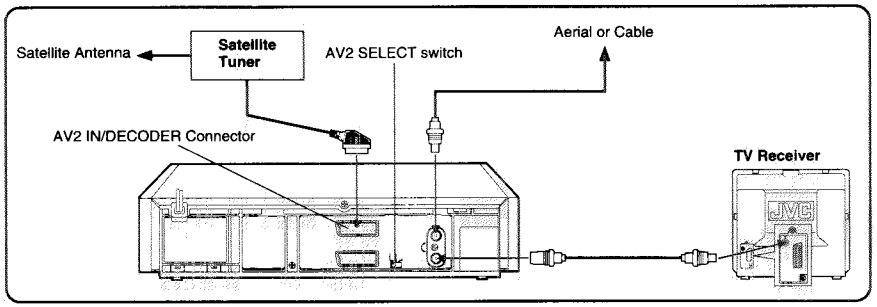
To Cancel:
3. Press CANCEL.
4. Press CH MAP and display the clock time.

NOTES:
- When you move to another area, be sure to make changes in the Channel Map as necessary.
- When the remote control's batteries are replaced, the time or Guide Channel numbers you have set may be erased. If this happens, reset them again.

Ex.: From column C in the list: The GUIDE PROG. number for WDR is "17".
From column A in the list: The TV PROG. number for WDR is "3".



Preparation for ShowView Timer Programming (cont'd)

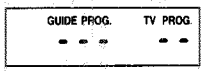


TO RECORD SATELLITE PROGRAMMES

Timer programming is also possible for programmes received via satellite tuner.

Preparation

1. **Connect the satellite tuner as illustrated to the AV2 IN/DECODER connector.**
   - Make sure the AV2 SELECT switch is set to "AV2".
2. **Press CH MAP until the Channel Map display (below) appears in the remote control's LCD.**



3. **Press the appropriate numeric keys to enter the GUIDE PROG. and TV PROG. numbers as follows:**
   - For GUIDE PROG., enter the GUIDE PROG. numbers of the satellite stations that are receivable through your satellite tuner.
   - For TV PROG., always enter "00". When "00" is entered, "AU" will appear in the LCD.

4. **Press SELECT.**
   - To input other satellite stations into the Channel Map, repeat steps 3 – 4 above.
5. **Press CH MAP and display the clock time.**

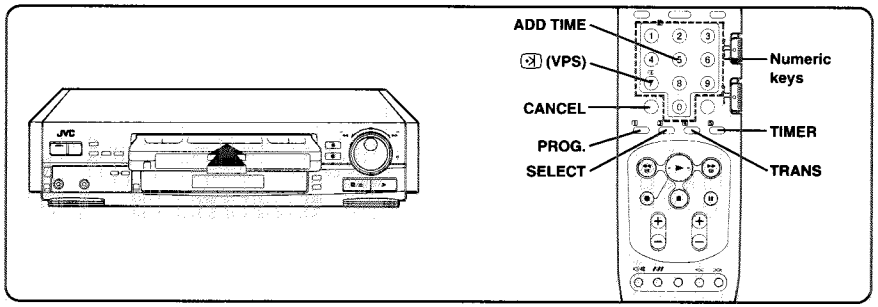
Operation

1. Turn on the satellite tuner and select the channel you wish to record.
2. Enter the ShowView number in the same way as shown in steps 1 – 6 of ShowView Timer Programming on p. 17.

NOTE:

- After selecting the programme you wish to record from your satellite tuner, set the system's timer. If your satellite tuner does not have a timer, leave it switched on.

Timer-Recording — ShowView Timer Programming —



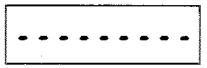
The built-in ShowView programming system greatly simplifies timer programming because you won't have to enter all the data that is usually necessary (such as date, start and stop time, and channel).

TIMER PROGRAMMING IS NOT POSSIBLE UNLESS THE CLOCK HAS BEEN SET.

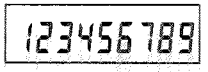
Preparation

- Make sure you have set the GUIDE PROG. numbers (☞ p. 14 – 16).
- Insert a cassette with the safety tab in place. The recorder power will come on automatically.

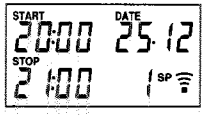
1. **Press PROG.**



2. **Press the appropriate numeric keys to enter the ShowView number for the TV programme you wish to record.**
   - For ShowView numbers, refer to your newspaper or TV directory.



3. **Press SELECT.**
   - The LCD will show the data for the ShowView number you just entered.
   - If the entered ShowView number is not proper, "Err" appears on the LCD. Check the ShowView number again and re-enter it.
   - If you wish to take advantage of VPS recording (☞ p. 19), "(VPS)" should be displayed on the LCD; if not, press (VPS) (the numeric key "7") to make it appear.



WEEKLY program: After step 3, press numeric key "9".
DAILY (Mon. – Fri.) program: After step 3, press numeric key "8".

4. **Press TRANS with the remote control directed toward the recorder's Remote Sensor window.**
5. **Press PROG.**
   - The LCD returns to the clock display and the entered data will be automatically cleared.
   - If you need to set another program, repeat steps 1 – 5.
6. **Press TIMER.**
   - The recorder will enter the Timer mode and power will go off.

TO DELAY THE STOP TIME

After you press SELECT in step 3, press the ADD TIME button. Each time the ADD TIME button is pressed, the Stop time is delayed by 5 minutes (5 minutes of recording time is added). You can easily compensate for anticipated programme schedule delays this way.

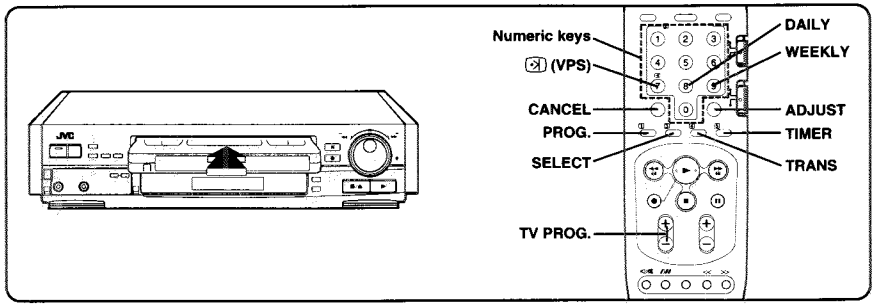
TO MAKE CORRECTIONS

- In step 2, press CANCEL to backspace and re-enter the correct ShowView number.
- After checking the data in step 3, press PROG. twice and re-enter the correct ShowView number.
- After checking the data in step 3, if you want to delay the stop time, etc. press SELECT to make the item you want to change blink, and input new data.
- Pressing PROG. clears the programmed data.

To check, cancel and replace programs, ☞ p. 18.

To use the recorder after setting to the Timer mode, ☞ p. 18.

Timer-Recording (cont'd) — LCD Timer Programming —



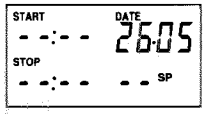
The LCD timer programming lets you input all necessary settings manually. It's helpful if the ShowView number for the TV programme you want isn't readily available.

Preparation

- Insert a cassette with the safety tab in place. The recorder power will come on automatically.

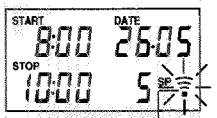
1. **Press PROG. twice.**
2. **Press numeric keys to input the date.**

   Ex.: For 26th May, press 2 6 0 5.



3. **Press numeric keys to input the start time, stop time and channel.**

   Ex.: For 8:00, press 0 8 0 0.



Transfer-ready mark

WEEKLY program: After you input the channel and the transfer-ready mark has appeared on the LCD, press numeric key "9".

DAILY (Mon. – Fri.) program: After you input the channel and the transfer-ready mark has appeared on the LCD, press numeric key "8".

- If you wish to take advantage of VPS recording (☞ p. 19), "⊡" should be displayed on the LCD; if not, press ⊡ (the numeric key "7") to make it appear.

4. **Press TRANS with the remote control directed to the recorder's Remote Sensor window.**
5. **Press PROG.**
   - The LCD returns to the clock display and the entered data will be automatically cleared.
6. **Press TIMER.**
   - The recorder will enter the Timer mode and power will go off.

TO MAKE CORRECTIONS

- During steps 2 and 3, press CANCEL to backspace and input new data.
- After setting the channel in step 3, press SELECT to make the item you want to change blink, and input new data.
- Pressing PROG. clears the programmed data.

TO CHECK, CANCEL AND REPLACE PROGRAMS

To check preset programs:

1. Press ADJUST until the program settings are displayed on the display panel.
   - Program 1 is displayed with the number blinking.
2. Press SELECT to review the program contents in succession.
3. To check another program, press ADJUST again.

To cancel the program:

4. Press CANCEL.
   - You can press CANCEL at any stage while the program is open.

To replace a program:

5. Use the SELECT and TV PROG. buttons to input new data.

TO USE THE RECORDER AFTER SETTING TO THE TIMER MODE

For safety, your recorder disables all other functions while in the Timer mode.

- Press TIMER to disengage the Timer mode.
- To re-engage the Timer mode, press TIMER.

NOTE:

- If you have a satellite tuner connected to the recorder's AV2 IN/DECODER socket and wish to timer-record satellite programmes, make sure to input "0" for the channel number in step 3 to make "AU" appear on the LCD. After you transfer the data to the recorder, "AU 2" will be displayed instead of a channel number on the recorder's display panel.

Error Indications

The following error indications may appear on the recorder when you press the TIMER button to engage the Timer Standby mode. Here's why, and what you should do.

- "TIMER" and "⊡" on the display panel continue blinking.
  WHY: There is no cassette in the recorder.
  WHAT TO DO: Insert a cassette.

- The cassette is automatically ejected. "TIMER" and "⊡" continue blinking.
  WHY: The inserted cassette has its safety tab removed.
  WHAT TO DO: Insert a cassette with its safety tab intact. Or cover the safety tab hole of the cassette with adhesive tape and re-insert it. ☞ p. 13.

- "TIMER" blinks for 10 seconds and the Timer Standby mode is cancelled.
  WHY: There are no preset programs in memory, or they have all been incorrectly preset.
  WHAT TO DO: Check the programmed data and re-program it as necessary. Press TIMER again.

Other Indications

- "TIMER" steady lit (with clock display).
  WHY: The recorder is in the Timer Standby mode. This is the normal display you should see when you press the TIMER button.

- " ○ " and "TIMER" steady lit.
  WHY: Normal display while timer-recording is in progress.

- The cassette was ejected, with power off and "TIMER" and "⊡" are blinking.
  WHY: This means that the end of the tape was reached while timer-recording was in progress. Therefore, the preset program may not be recorded in its entirety.

- "0:00" blinking.
  WHY: This means the clock must be set. It's displayed when time-keeping is terminated due to a power failure or because the recorder's power plug was pulled from the AC outlet.
  WHAT TO DO: Set the clock. ☞ p. 7.
- If power was interrupted, it's also likely that all preset timer programming data has been erased. Please check and re-program as necessary.

- "-- -- -- -- --" is displayed for about 5 seconds when the TRANS button is pressed.
  WHY: Data was not successfully transferred. The program may have been incorrectly preset, or the recorder's clock has not been set, or all the recorder's timer programs (1 – 8) are preset.
  WHAT TO DO: Check the LCD program, and re-program as necessary. Transfer the correct data. Or cancel unnecessary programs, and transfer again.

VPS Recording

Now available from some TV stations, VPS (Video Program System) is a service designed to assure safe, accurate timer-recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over advertised times you preset in the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed.

TO USE VPS SERVICE

- During ShowView or LCD timer programming, make sure that "⊡" is displayed on the LCD before transferring the programme data to the recorder.
- If "⊡" is not displayed on the LCD, press the ⊡ button (the numeric key "7") to make it appear. Pressing the ⊡ button alternates the setting.

NOTES:

- When you enter programmes, set the start time (VPS time) exactly as advertised in the TV listing. A different time than advertised will result in no recording.
- VPS recording is not possible via external input.

Locking The Recorder's Controls

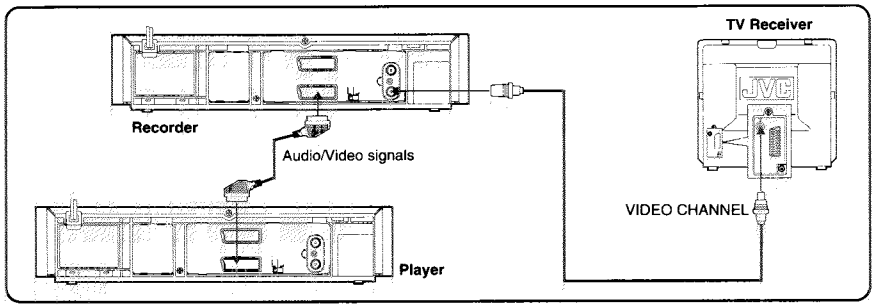
To avoid unwanted operation and prevent accidental recording...

1. Press the remote control's OPERATE button to turn the recorder's power off. Keep this button pressed for about 2 more seconds after the power LED indicator has gone off.
   - The Child Lock indicator (–) will appear on the display panel.
2. Child Lock is cancelled when you switch the recorder's power on with the remote's OPERATE button.
   - Pressing the TIMER button during timer-recording also cancels the Child Lock mode.

NOTES:

- While Child Lock is engaged, make sure you keep your remote control in a safe place inaccessible to children.
- Timer-recording is possible in the Child Lock mode. After timer-recording is done, Child Lock remains in effect.

Editing



Editing To/From Another Recorder

Preparation

■ Connect the player's AV1 IN/OUT connector to the recorder's AV1 IN/OUT or AV2 IN/DECODER connector.

	Player	Recorder
1	Load the source tape.	Load the recording tape.
2		Select the external input mode. **With this video recorder,** ■ If connected to the AV1 IN/OUT connector, press TV PROG. until "AU 1" appears on the display panel. ■ If connected to the AV2 IN/DECODER connector, make sure the AV2 SELECT switch is set to "AV2", and press TV PROG. until "AU 2" appears.
3		Press and hold down the Pause button while you press the Record button to enter the Record-Pause mode.
4	Play back the source tape to search for a scene to be edited.	
5		Start recording where you want to start editing, with this recorder, by pressing the Play button.
6		To stop editing temporarily, press the Pause button.
	Repeat steps 4 through 6 to continue editing.	
7	To stop editing, press the Stop button.	

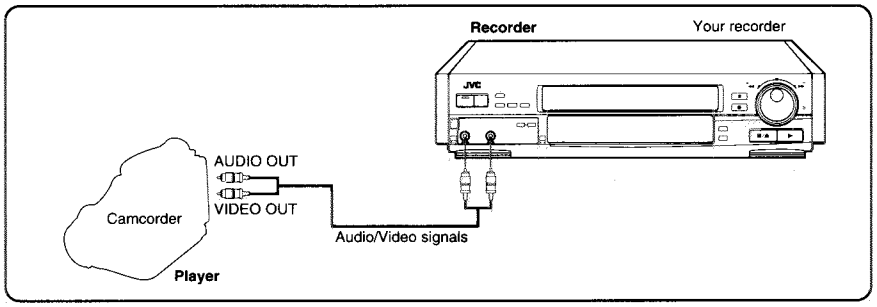
Remote A/B Code Switching

The remote control is capable of controlling two JVC video recorders independently; one set to respond to your remote control's A code control signals and another set to respond to B code control signals. The remote control is preset to send A code signals because your video recorder is initially set to respond to A code signals. You can easily modify your video recorder to respond to B code signals.

1. Unplug the recorder's power cord from the AC outlet.
2. Set the A/B code switch to B.
3. Plug the power cord back into the AC outlet. Do not use other remote controls at this stage.
4. Turn the recorder power on using the remote control's OPERATE button. The recorder will now only respond to B code signals.

NOTE:

Some TV sets may malfunction in response to the B mode. If this happens switch back to the A mode.



Editing From A Camcorder

Preparation

■ Connect the camcorder's A/V output connectors to the recorder's front panel VIDEO and AUDIO connectors.

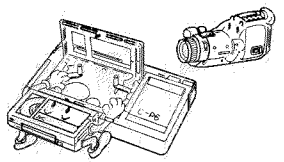
	Camcorder	Recorder
1	Load the source tape.	Load the recording tape.
2		Select the external input mode: ■ Press the numeric key "0". "F-AU" will appear instead of a channel number.
3		Press and hold down the Pause button while you press the Record button to enter the Record-Pause mode.
4	Play back the source tape to search for a scene to be edited.	
5		Press the Play button where you want to start editing.
6		To stop editing temporarily, press the Pause button.
	Repeat steps 4 through 6 to continue editing.	
7	To stop editing, press the Stop button.	

NOTE:

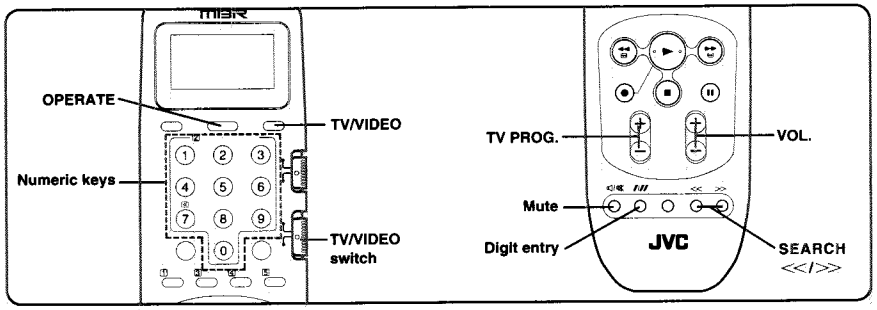
■ Connections made to the front panel Video and Audio input automatically override the rear panel AUDIO/VIDEO input connection.

To Watch A Compact VHS Tape

Compact VHS camcorder recordings can be played on your video recorder. Place the recorded cassette into a C-P6 Cassette Adapter and it can be used like any full-sized VHS cassette.



Using The Remote Control For TV Operation



TV Code Setting

Your remote control can operate the basic functions of your TV set. In addition to JVC televisions, other manufacturers' televisions listed on the right can also be controlled by setting the remote control to "TV". If your television is a JVC (Code 1), you don't have to set the TV code in step 2.

1. Set the TV/VIDEO switch to "TV".
2. While holding down the OPERATE button, press the numeric keys corresponding to the code number for your TV's brand.
   - Press OPERATE to turn the TV power on.
   - Press TV/VIDEO to switch the TV between TV and VIDEO (or AV) mode.
   - Press TV PROG. to select the TV's channel.
   - Press VOL. to adjust the TV's sound volume.
   - Press Mute to mute the TV's sound.
3. To operate your recorder, set the TV/VIDEO switch back to "VIDEO".

NOTES:

- The TV PROG. button does not function with televisions using Code 2.
- The TV/VIDEO button does not function with televisions using Code 3.
- With some televisions, the OPERATE button functions only to turn the TV power off, and the TV/VIDEO button functions only to switch the TV to the VIDEO (AV) mode.
- Whenever you replace batteries in the remote control, it is necessary to re-set the TV code if your television is not a JVC TV.

IMPORTANT
Although the provided remote control unit is compatible with JVC televisions, as well as many TV models manufactured by others, it is possible that the provided remote control will not work with your TV, or in some instances, will have limited function capability.

CODE	TV BRAND NAME
1	JVC
2	BRANDT, NORDMENDE, SABA, TELEAVIA, TELEFUNKEN, THOMSON
3	FERGUSON
4	PHILIPS
5	BLAUPUNKT, GRUNDIG
6	SONY
7	PANASONIC
0	GRAETZ, ITT, LUXOR, SALORA, SELECO

To Control Your Television With Additional Buttons

The numeric keys can also be used to select the TV's channel by setting the remote control to the TV mode.

1. Set the TV/VIDEO switch to "TV".
2. Use the numeric keys and the Digit entry button or the SEARCH <</>> buttons to select the TV's channel.
   - With televisions using Code 1, 3, 4, 6 or 7 the Digit entry button corresponds to the 1-digit/2-digit entry switching button (often labelled -/--) of your TV's remote control.
   - With televisions using Code 1, 5 or 0, the SEARCH << button corresponds to the 10 + button, and the SEARCH >> button, to the 20 + button of your TV's remote control.

NOTE:
The way these buttons are used is determined by your TV. Use these buttons as instructed for your TV's remote control.

Precautions

Please follow these safety precautions. Not doing so may result in damage to the recorder, remote control, or video cassette.

- **Avoid extreme heat and direct sunlight.**
- **Avoid extreme cold.**
- **Avoid extreme humidity.**
- **Avoid dust.**
- **Avoid places subject to vibrations.**
- **Avoid strong magnetic fields.**
- **Do not block the recorder's ventilation openings.**
- **Do not place anything heavy on the recorder or remote control.**
- **Do not place anything which might spill on top of the recorder or remote control.**
- **Do not place the recorder on cushions, pillows, or thick carpeting.**
- **Use the recorder in a stable, horizontal position only.**

Beware of moisture condensation
Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions — just as water droplets form on the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder's power turned on for a few hours to let the moisture dry.

When transporting

- Be sure to remove cassette from recorder before packing.
- Avoid violent shocks to the recorder during packing and transport.

Place cassettes in cassette cases and store vertically.

Specifications

GENERAL

Power requirement	: AC 220 – 240 V~, 50/60 Hz
Power consumption	: 20 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Dimensions (WxHxD)	: 426 x 94 x 341 mm
Weight	: 4.5 kg
Format	: VHS PAL standard
Maximum recording time	: 240 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording/Playback system	: Rotary two-head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: 21-pin scart connector x 2 (IN/OUT x 1, IN/DECODER x 1) RCA connectors (VIDEO IN x 1, AUDIO IN x 1)

TUNER/TIMER

TV channel storage capacity	: 80 positions (+AUX position "AU")
Channel coverage	: VHF 47 – 89/104 – 300/ 302 – 470 MHz UHF 470 – 862 MHz
Aerial output	: UHF channel 36 (Adjustable 32 – 40)
Memory backup time	: Approx. 3 min.

ACCESSORIES

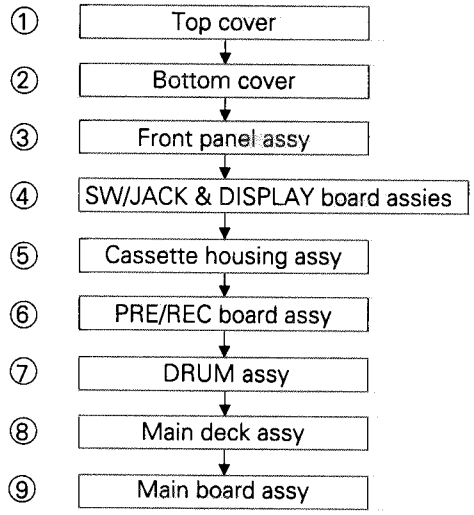
Provided accessories	: Aerial cable, Infrared remote control unit, "R6" battery x 2

Design and specifications subject to change without notice.

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists shows the disassembly steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend,route and dress the flat cables as they were originally.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1)	
②	BOTTOM COVER	D2	(S2), 7(L1)	
③	FRONT PANEL ASSY	D3	7(L2),*JOG/SHUTTLE	<NOTE 1>
④	SW/JACK & DISPLAY BOARD ASSIES	D4	12(L3),*CN1,	<NOTE 2>
⑤	CASSETTE HOUSING ASSY	D5	4(S3) EARTH PLATE	<NOTE 3>
⑥	PRE/REC BOARD ASSY	D6	2(S4),*CN1 *CN201,*CN202 SHIELD CASE	

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig.No. showing procedure or part location
(4) Indentification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook,unlock, release,unplug or unsolder.
(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	5(S1) SIDE PANEL (L),(R) (HR-E226EG)	
②	BOTTOM COVER	D2	(S2), 7(L1)	
③	FRONT PANEL ASSY	D3	7(L2),*JOG/SHUTTLE (HR-E226EG)	<NOTE1>
④	SW/JACK & DISPLAY BOARD ASSIES	D4 2	12(L3),*CN1 *CN4 (HR-E226EG)	<NOTE2>
⑤	CASSETTE HOUSING ASSY	D5	2(S3),2(S8) EARTH PLATE	<NOTE3>
⑥	PRE/REC BOARD ASSY	D6	2(S4),*CN1 *CN201,*CN202 SHIELD CASE	
⑦	DRUM ASSY	D7	3(S5),WR1,4(L4) INERTIA PLATE	<NOTE4>
⑧	MAIN DECK ASSY	D8	2(S6),WR2 WR3,2(L5),*CN603	<NOTE5>
⑨	MAIN BOARD ASSY	D9	2(S7)	

<NOTE1>
When reattaching the front panel assy, make sure that the door opener of the cassette housing assy is lowered in position prior to the reinstallation.

<NOTE2>
When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE3>
When reattaching the cassette housing assy, pay careful attention to the switch lever not to make it touch the REC switch knob of the REC SAFETY board assy from the up-side.
(If the REC switch knob of the REC SAFETY board assy is damaged, cassette loading is impossible.)

<NOTE4>
When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE5>
- When removing the Main deck assy only, unhook the two spacers connecting it with the Main board assy with pliers from the back side of the Main board assy first, and then remove the Main deck assy.
- When reattaching the Main deck assy to the Main board assy, make sure to set the spacers into the retaining slots respectively.

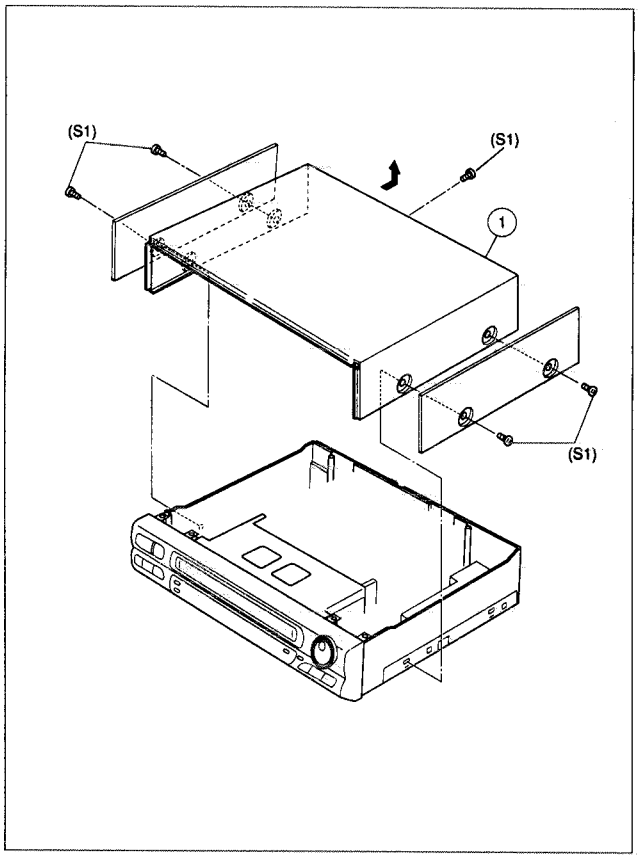


Fig. D1

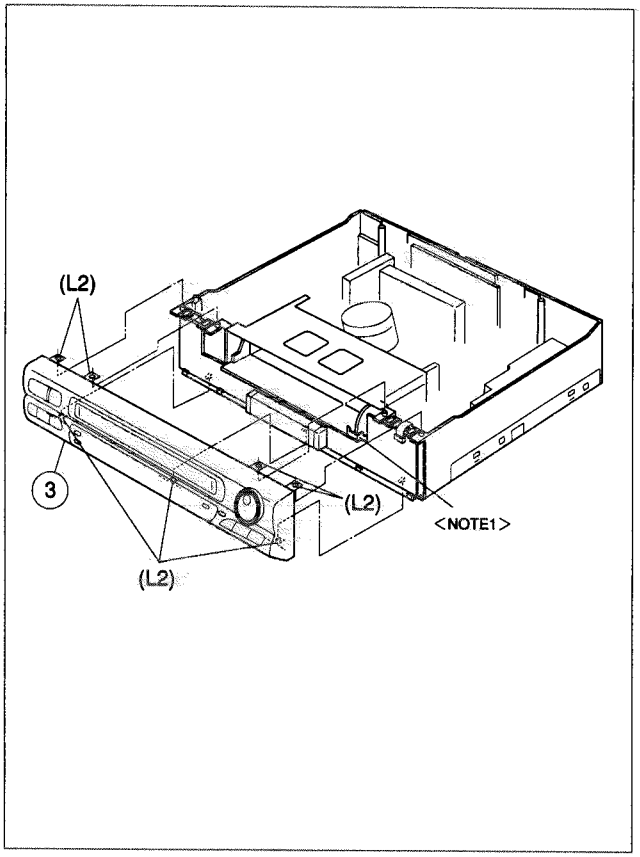


Fig. D3

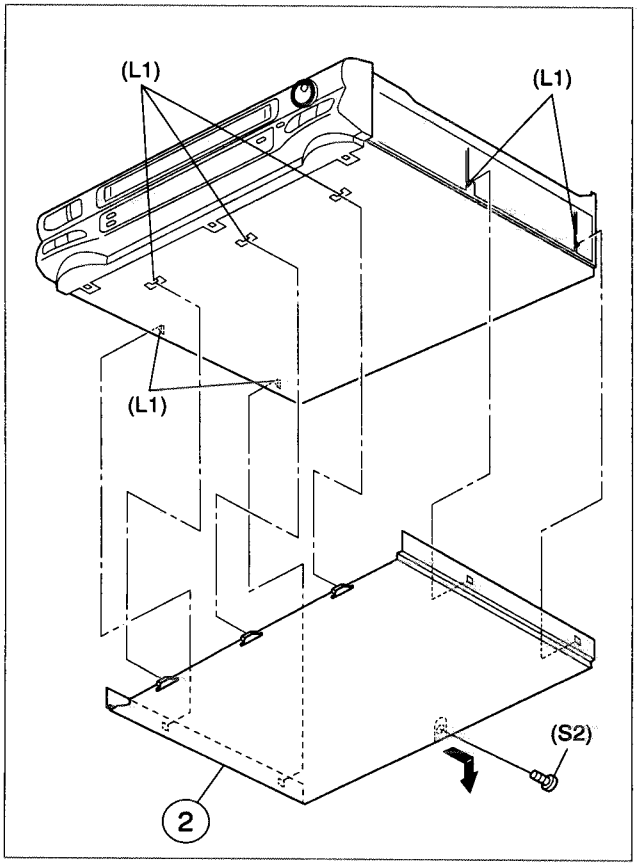


Fig. D2

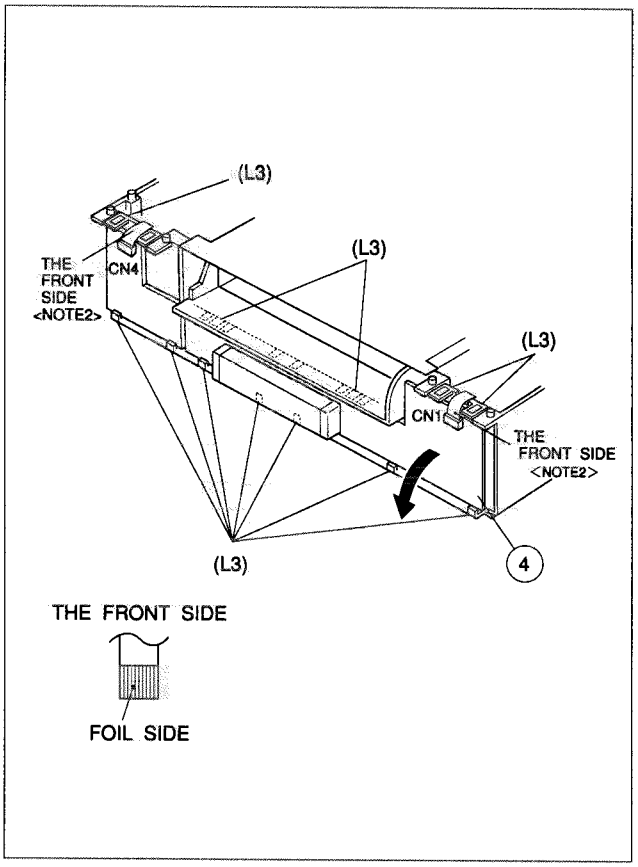


Fig. D4

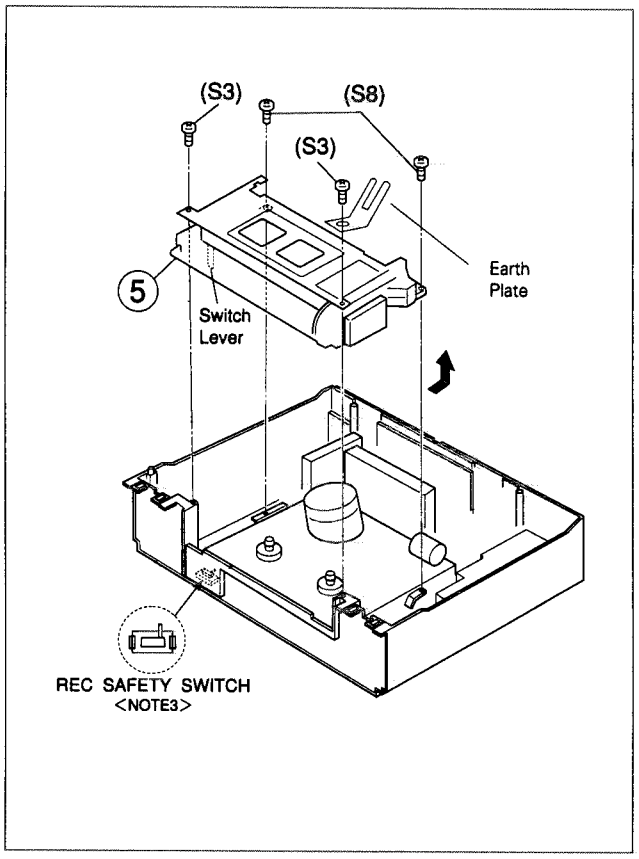


Fig. D5

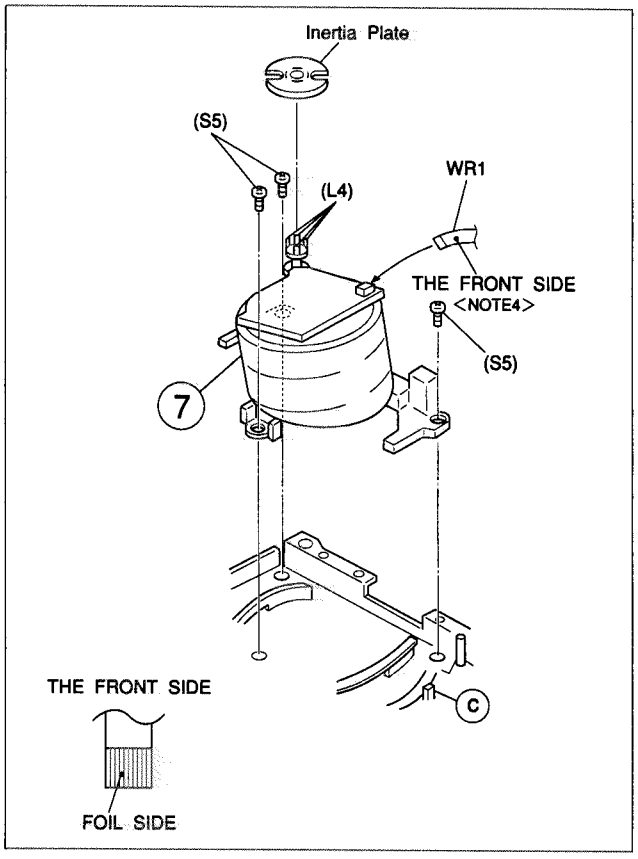


Fig. D7

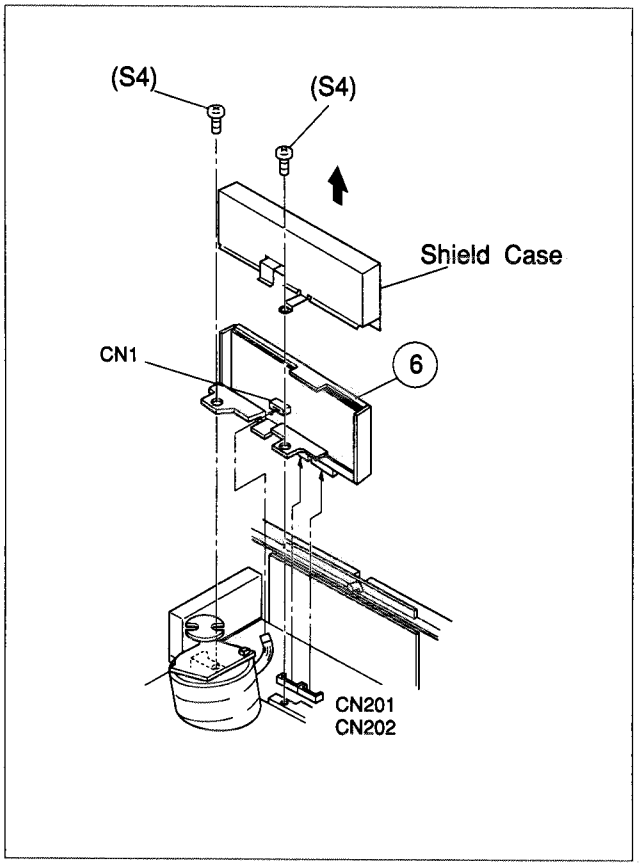


Fig. D6

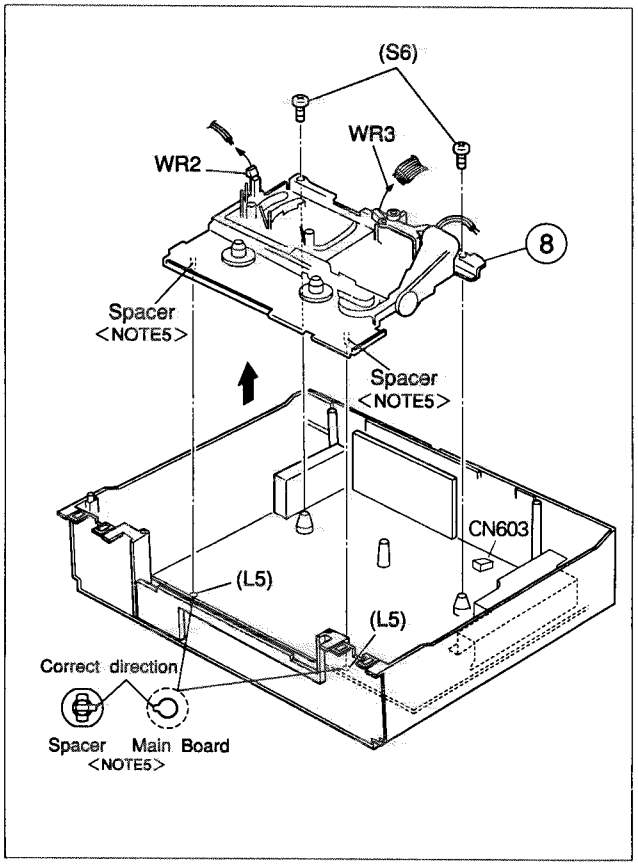


Fig. D8

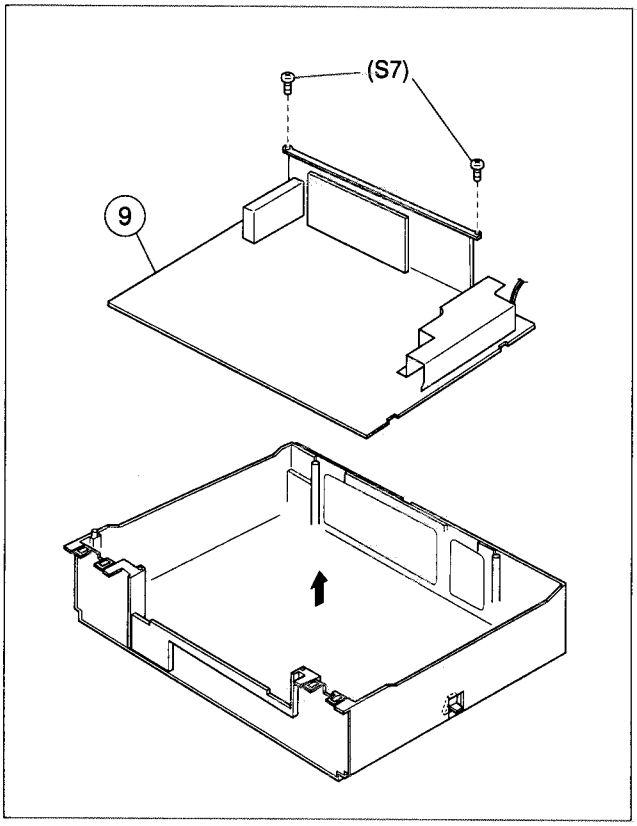


Fig. D9

1.4 CASSETTE HOUSING INSTALLATION

NOTE: *Observe the mechanical phase and position (see figure) when installing the cassette housing assembly. If these are incorrect, the system will not operate properly even when tape is inserted.*

1. Check that the hole of the control cam are aligned to the deck hole. If necessary, turn the mode motor belt by hand to adjust the position.

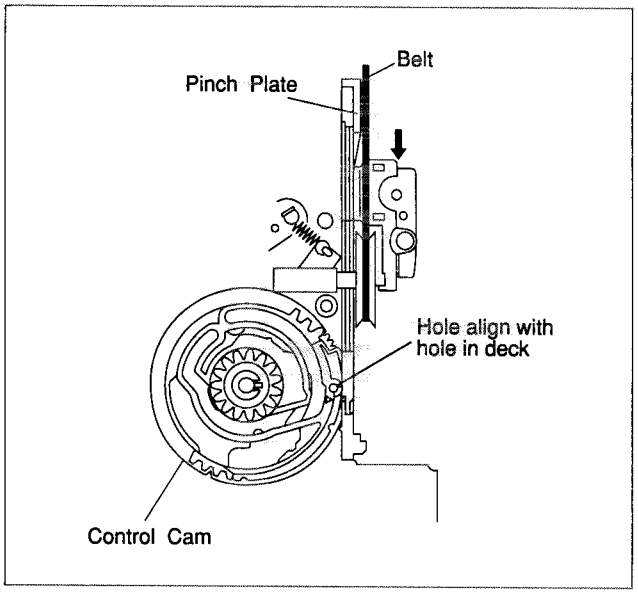


Fig. 1-4-1

1.5 SERVICE POSITION

1.5.1 How to take out the Mechanism and Main board assemblies.

(1) Remove the Top cover, Front panel assy and CN1 of the DISPLAY board assy.
(2) Take out 4 screws (A) 2 screws (B) and 1 screw (C) as shown in Fig.1-5-1.

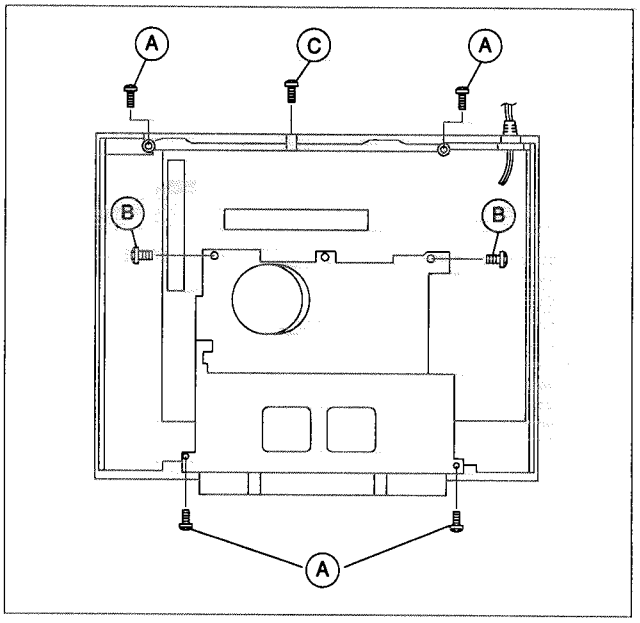


Fig. 1-5-1

(3) Remove the Mechanism assy (including Cassette housing) and Main board assy out of the chassis as shown in Fig. 1-5-2.

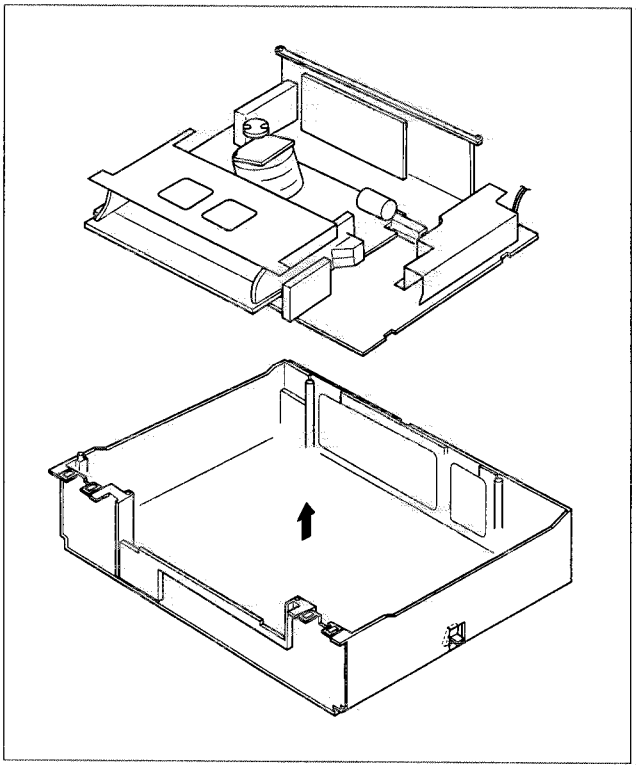


Fig. 1-5-2

(5) Turn over the Mechanism assy and Main board assy then connect CN1 of the DISPLAY board assy.
(6) Carry out checks & repairs as necessary as shown in Fig.1-5-3.

Note: *When input the AUDIO/VIDEO signal from connector, connect CN4 of the SW/JACK board assy.*
[HR- E226EG]

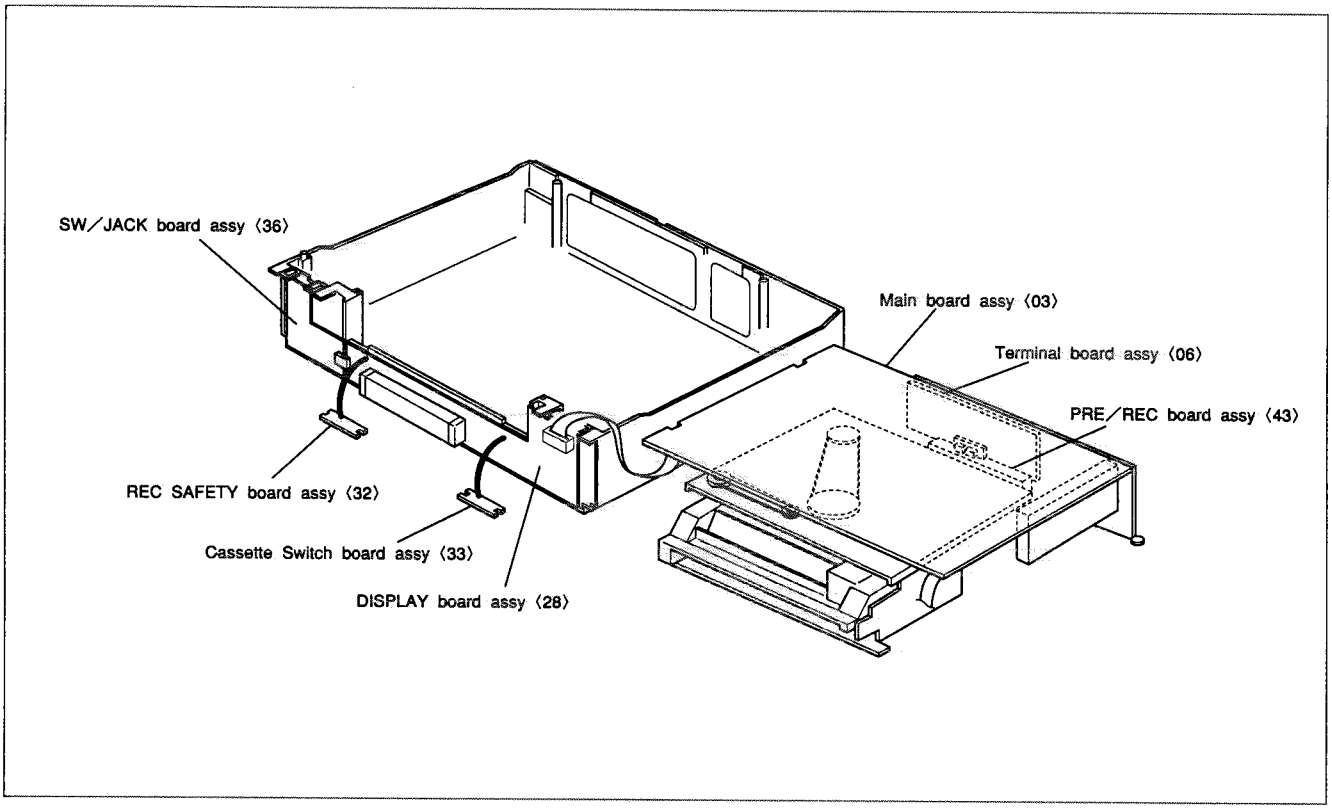

SW/JACK board assy (36)
Main board assy (03)
Terminal board assy (06)
PRE/REC board assy (43)
REC SAFETY board assy (32)
Cassette Switch board assy (33)
DISPLAY board assy (28)

Fig. 1-5-3

1.5.2 Cautions on cassette loading when mechanism is in service position

The REC SAFETY board assembly of this set serves both for detecting the safety tab (erasure prevention tab) of a cassette and detecting a cassette loaded. Therefore, cassette loading in the condition that the mechanism is disassembled from the set needs manual operation of the switches of the REC SAFETY board assembly and the CASSETTE SWITCH board assembly.

1.5.3 Cassette loading and ejecting procedures when mechanism is in service position

(1) Insert a cassette tape halfway into the cassette housing assembly.
(2) Press the switch of the REC SAFETY board assembly to turn on.
(3) When the cassette loading begins and the cassette goes down to the bottom, immediately press the switch of the REC SAFETY board assembly to turn off and hold the status that the switch of the CASSETTE SWITCH board assembly is turned on. (Fix the switch with adhesive tape or put a screwdriver, etc. on it to leave the switch in the ON status.)
(4) In this status, desired operations (recording, playback, fast forward, rewind, etc.) can be performed.

Note: *When the mechanism is in the service position, the safety tab of cassette tape is not detected and recording on cassette tapes without safety tab is possible. Therefore, carefully choose a cassette tape for operation in this mode so as to avoid using cassette tapes of important recording.*

(5) For ejecting the cassette in this status, do it in the reverse order of cassette loading mentioned above.

Note: *If the manual operation REC SAFETY switch timing is incorrect, the cassette may be completely or partially ejected, and the cassette is often ejected incompletely. In such a case, it is possible to take out the cassette by hand.*

If it is desired to load a cassette again after the cassette is ejected in the above procedure, make sure to set the tray of the cassette housing assembly in the frontmost position prior to loading the cassette once again.

1.5.4 Opening on the chassis.

The chassis assy has openings for easy access to the check-points and connector pins as shown in Fig.1-5-4.

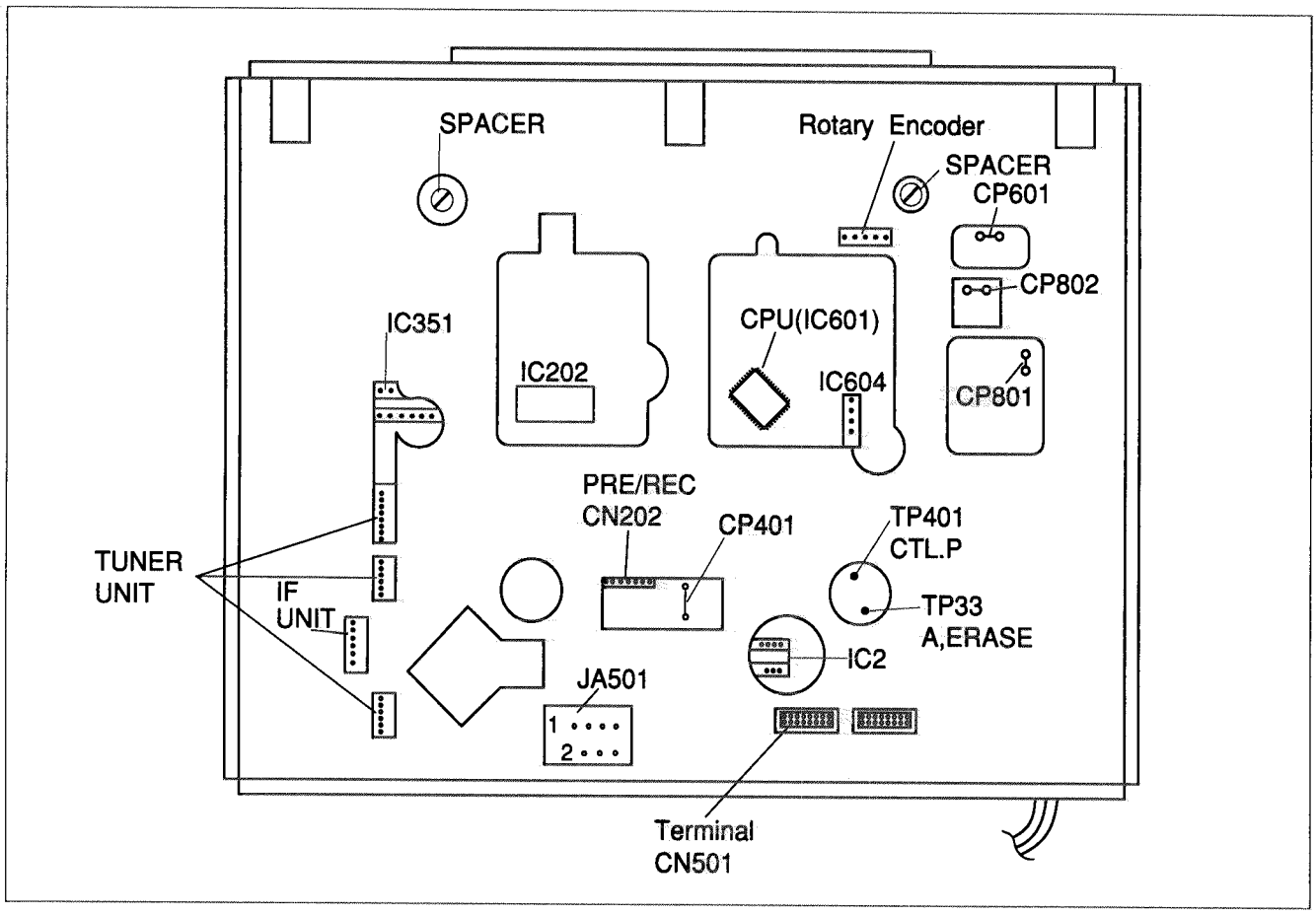


Fig. 1-5-4

1.6 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.6.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Remove the Top cover, Front panel assy and cassette housing assy. (See Page 1-2, 1-3)
(3) Connect TP2 (GND) and TP1 (TEST) on the DISPLAY board assy with a jump wire.
(4) Connect VCR to AC.
(5) Press the POWER button.
(6) Select the desired operation modes with the operation buttons or remote controller.

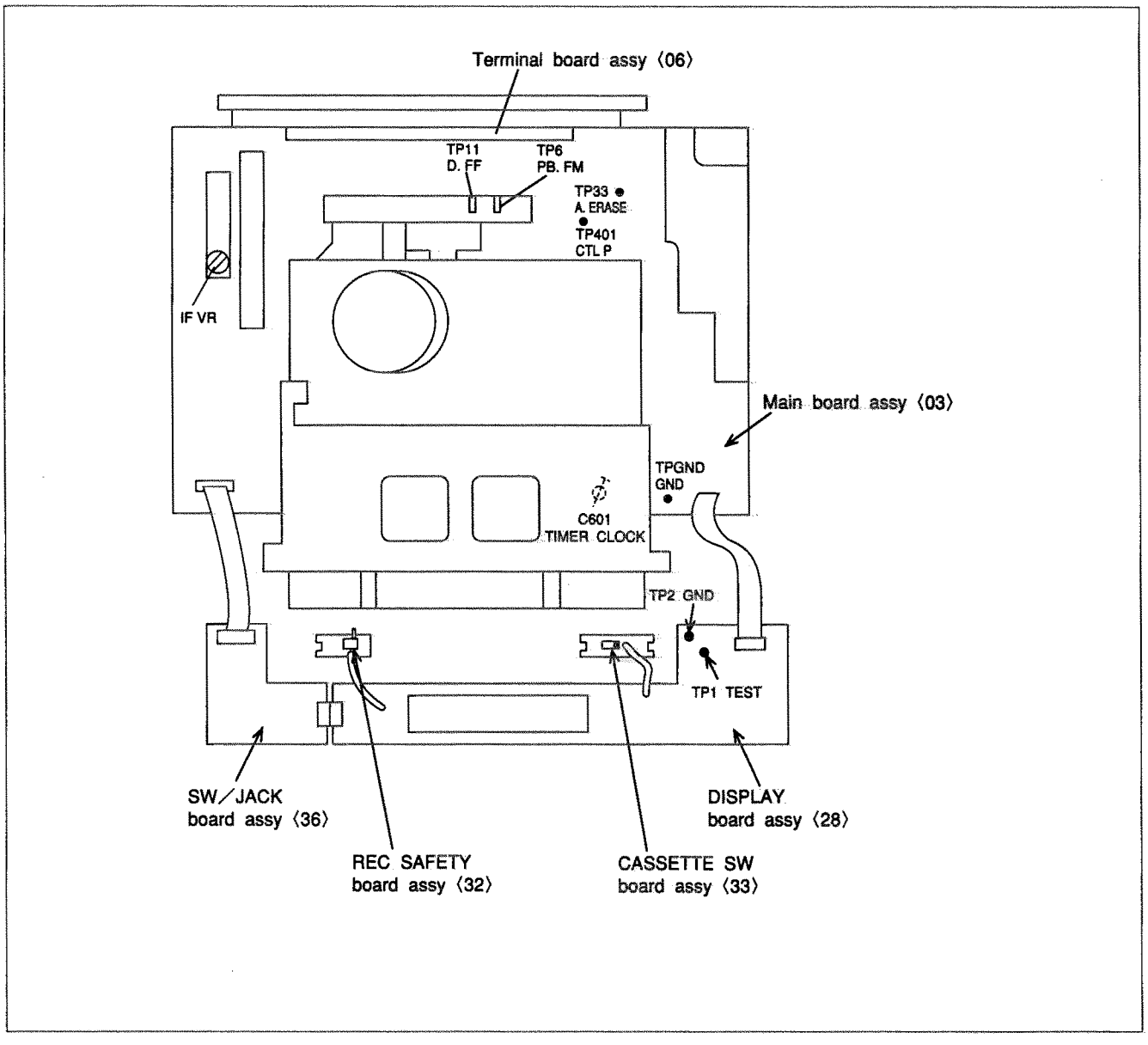


Fig. 1-6-1

1.7 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.7.1 How to display record of an emergency faults

(1) Press "N" button of the presetting unit more than 2 seconds. and the two previous emergency faults are shown in the FDP.
(2) Press "N" button of the presetting unit again when return the normal mode.

[Example] E : 01 : 03

- 03 — Emergency faults before last
- 01 — Emergency faults of the last time

[Example] E : — — : — — ← No record of emergency

1.7.2 Detail of emergency faults

FDP	Symptom	Detect mode	Resulting mode
E : 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E : 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E : 03	TU REEL FG input is absent(for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 04	DRUM FF input is absent(for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP
E : 06	CAPSTAN FG input is absent(for more than 1 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-7-1 EMERGENCY FAULTS

1.7.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode,and the record of the emergency fault(s) is cleared.

SECTION 2
MECHANISM ADJUSTMENT

2.1 PREPARATION

2.1.1 Precautions

(1) Disconnect VCR from AC power before soldering.
(2) Avoid imparting stress to wires when disengaging connectors.
(3) Determine and correct the cause of difficulty before proceeding to adjustments.Do not disturb settings unnecessarity.
(4) Use care not to damage tabs,claws,etc during repairs.
(5) Install the cassette housing assy only when the mechanism is in the MECHANISM ASSEMBLING MODE position.
(6) When installing the Front panel assy,be sure to engage the housing door with the door opener of the cassette housing assy.
If this is omitted,the cassette door will not open at Eject and the cassette can not be removed. (See SECTION 1 DISASSEMBLY.)

2.1.2 Check without cassette housing assy.

Mechanism operations can be observed easily by removing the cassette housing assy. Use the MECHANISM SERVICE MODE (See SECTION 1 DIASSEMBLY)

2.1.3 Manual removal of loaded tape

When the deck enters the emergency mode with cassette tape loaded and it can not be ejected by pressing the EJECT button,take out of the cassette tape according to the following procedure.
(1) Disconnect the power cord from AC outlet then take out the Top cover and Front panel assy.
(2) Turn the mode motor on the Main deck assy by hand in the unloading direction to where the pole base assy (supply and take-up) is positioned below the cassette tape.At that time, pay careful attention to the tape not to get soiled with grease.
(3) Take out 4 screws of the cassette housing assy.(See SECTION 1 DISASSEMBLY)
(4) Remove the cassette housing with slackened tape and guard panel of cassette.
(5) Wind up the tape by turning the reel hub(either supply or take-up side for convenience) from the bottom of the cassette,and remove the cassette tape.

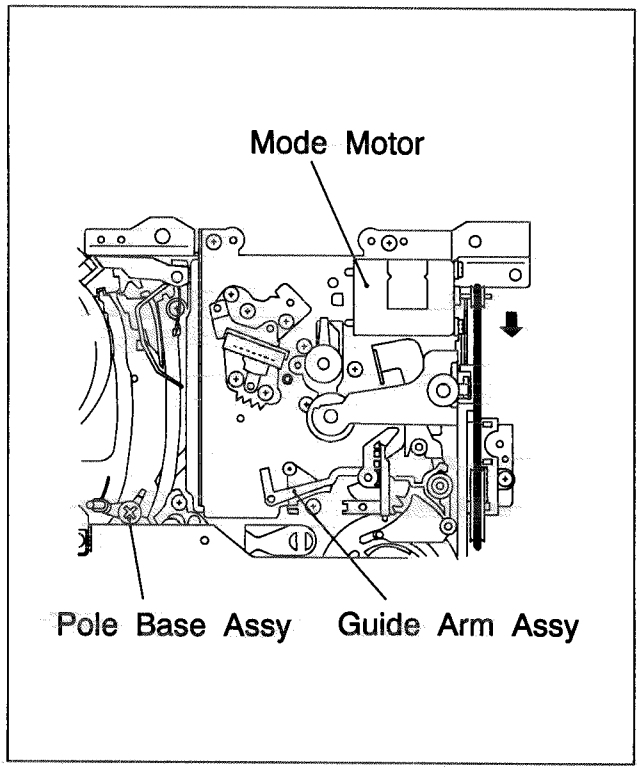


Fig. 2-1-1

2.1.4 Test Equipment

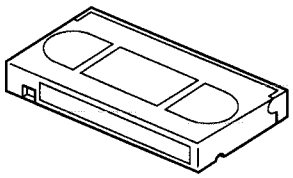
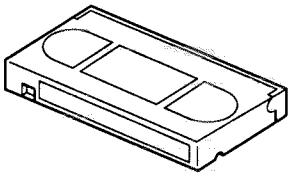
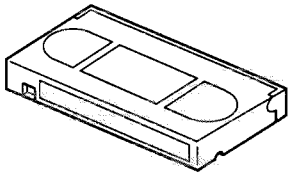
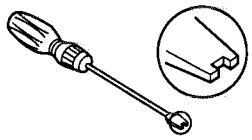
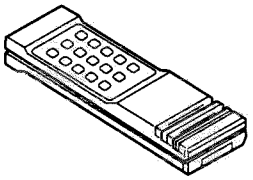
Alignment tape (SP) MHPE	Alignment tape (EP) MHPE-L	Back tension cassette gauge PUJ48076-2	A/C head positioning tool PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Grease KYODO-SH-P	
			

Table 2-1 Test equipment

2.2 MAIN MECHANISM PARTS

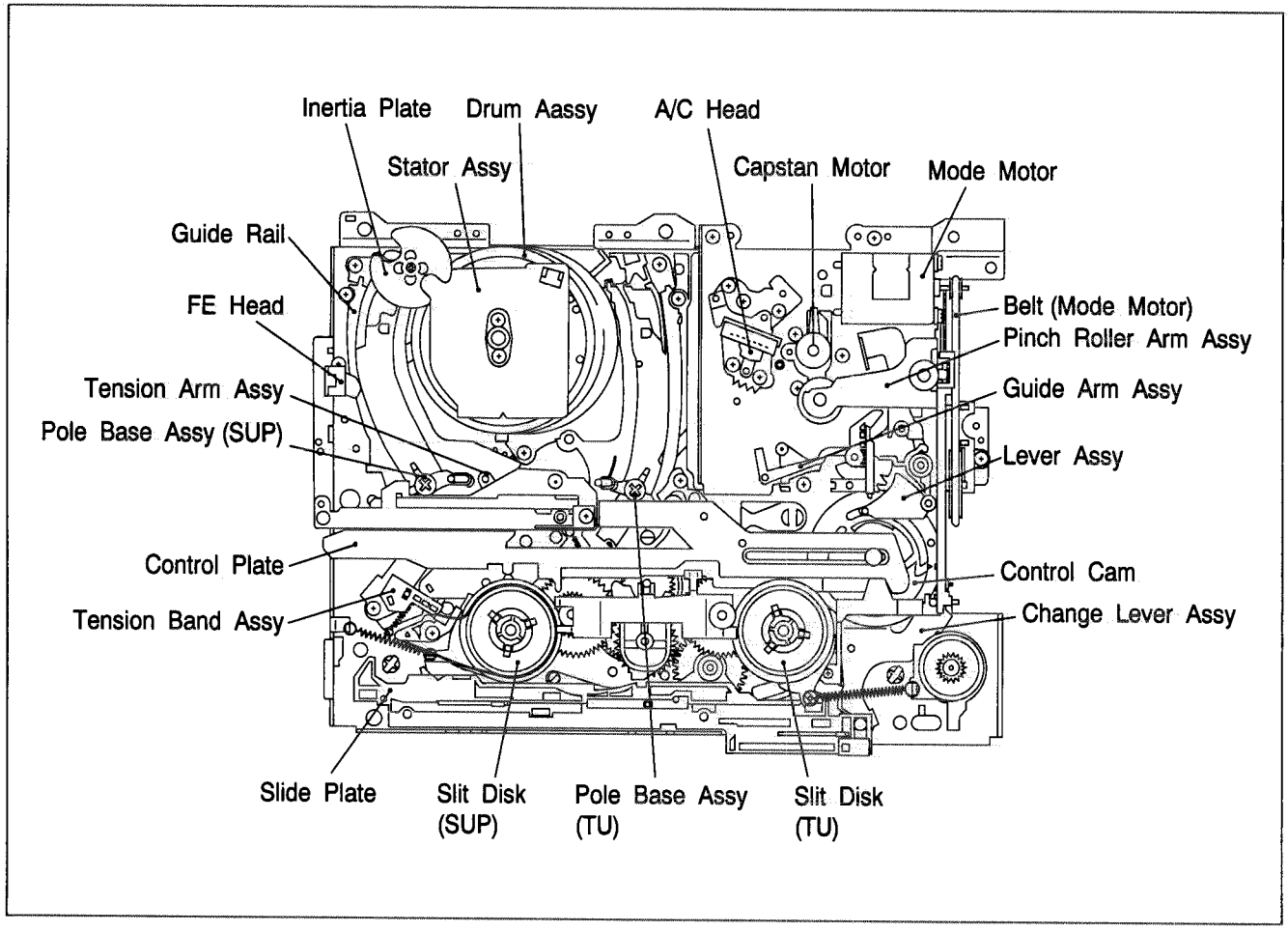


Fig. 2-2-1 Top view of main deck

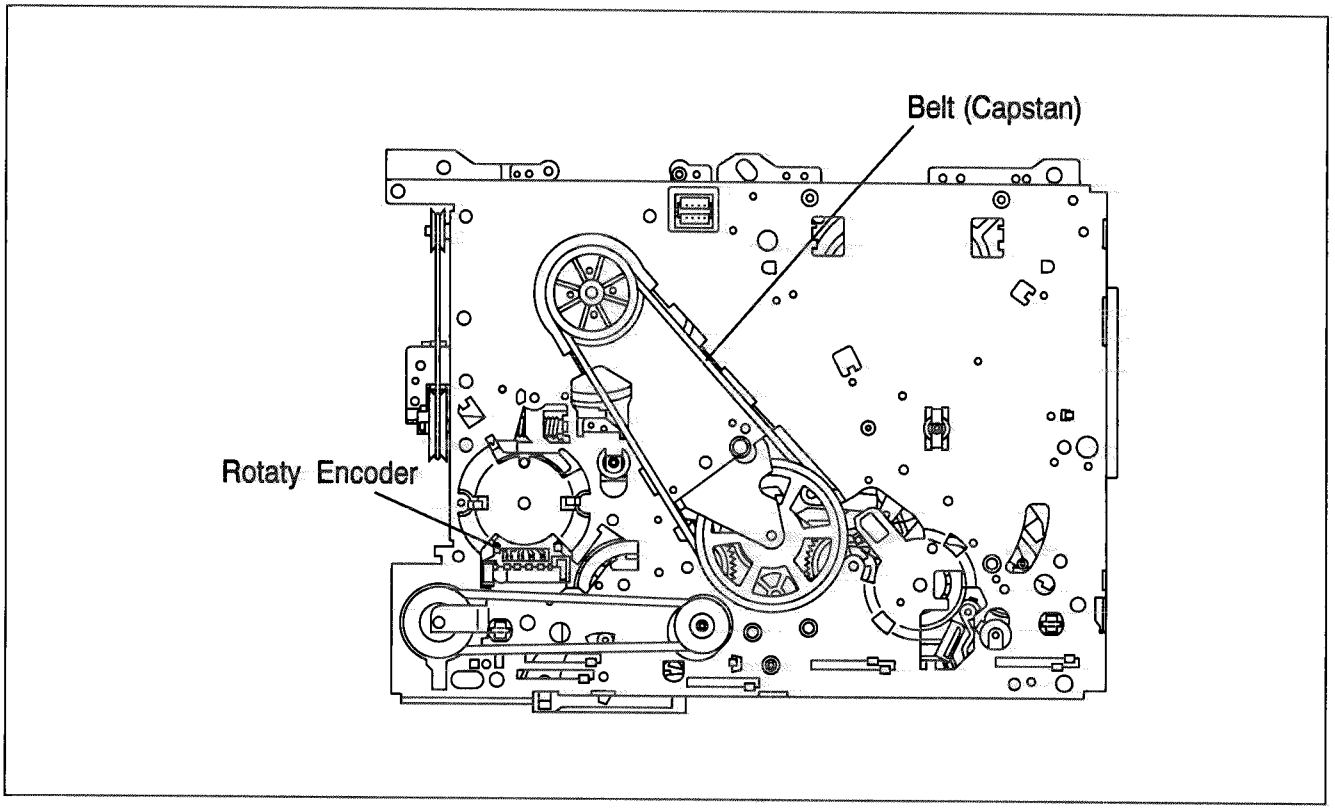


Fig. 2-2-2 Bottom view of main deck

2.2.1 Cleaning

Periodic cleaning of the tape transport system is desirable,but ordinarity not feasible in practice.Therefore,perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads,tape guides and brush can detract from playback picture quality and in extreme cases,even damage the tape.For cleaning,use a finemesh cotton cloth(about the texture of a while dress-shirt) moistened in alcohol. It is recomended to also clean thetape tension posts and capstan.

- To clean the video heads,press the moistened cloth gently against the upper drum with fingertip and turn the drum gy hand.
- Do not use a vertical stroke,as this may damage the heads.

2.2.2 Lubrication

Oil and grease do not normally require periodic replenshing. Apply only when replacing lubricated parts(also clean and replace lubrication of mating parts if soiled). For parts and points to apply oil and grease, refer to the exploded views of the mechanism assy. Before oiling,clean with alcohol.Apply one or two drops of oil. Avoid excess oil.

1. Table 2-2-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KYODO-SH-P

Table 2-2-1

2. Grease is not required for a replacement cassette housing assy,as this has been applied at the factory.

NOTE : *Stir grease that has been stored for an extended period.*

2.3 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage.Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced as and when required.

2.3.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assy	★○	○
	A/C head	★○	★○
	Lower drum motor assy	★	★○
	Pinch roller arm assy	★	★
	Full erase head	★	★
	Tension arm assy	★	★
	Guide arm assy	★	★
Drive	Capstan motor		○
	Belt (Capstan)	○	○
	Belt (Mode motor)		○
	Mode motor		○
	Slit disk (supply, take-up)		○
	Clutch unit (supply, take-up)		○
	Worm gear assy		○
	Control plate		○
	Slide plate		○
Other	Brush assy	★○	★○
	Tension band assy	○	○
	Rotary encoder		○

★ : Cleaning
○ : Inspection or Replacement if necessary

Table 2-3-1

2.4 DISASSEMBLY/ASSEMBLY PROCEDURE OF MECHANISM

2.4.1 Precaution before disassembling mechanism

This mechanism has an exclusive operation mode provided for disassembling and installation of the mechanism (MECHANISM ASSEMBLING MODE), and it is suggested to set the mechanism to this mode before disassembly and installation.The exclusive mechanism operation mode is not generally used and becomes available by manual setting only. Then this procedure starts with the condition that the cabinet parts,cassette housing assy and PRE/REC board assy have been removed.

2.4.2 How to set the exclusive mechanism operation mode (MECHANISM ASSEMBLING MODE)

(1) Turn the mode motor belt by hand.
(2) Confirm that the hole of the control cam are aligned to the deck hole as shown in Fig.2-4-1.

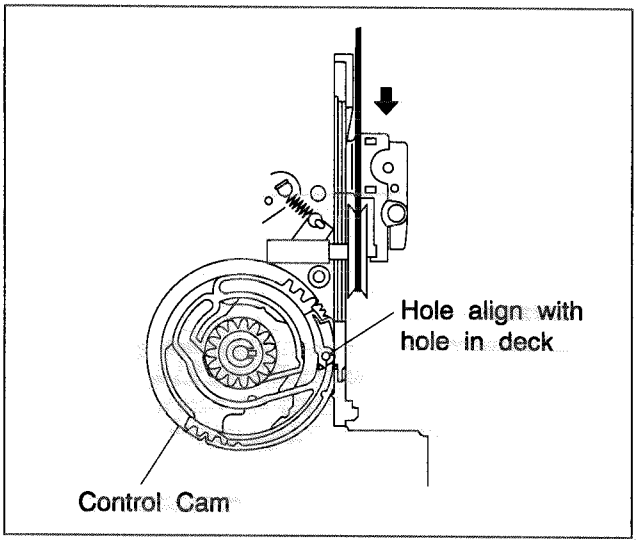


Fig. 2-4-1

2.5 MAIN PARTS REPLACEMENT OF MECHANISM

2.5.1 Pinch Rollar Arm ASSY

(1) Remove the slit washer.
(2) Tilt up the pinch rollar assy in direction of arrow.

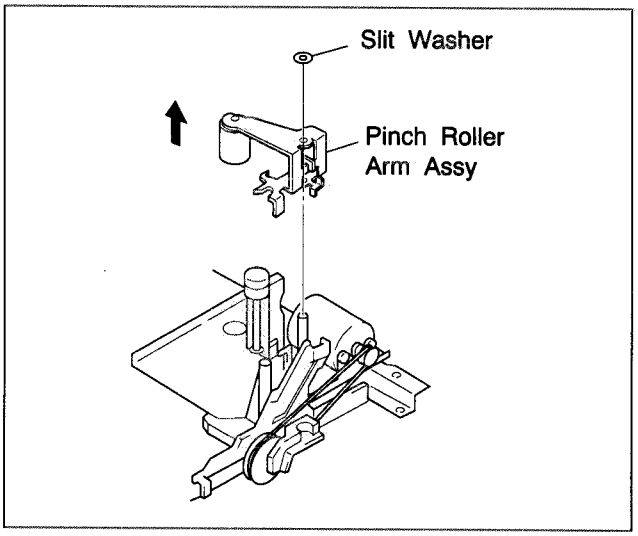


Fig.2-5-1

2.5.2 A/C Head

1. Removal

(1) Take out 2 screws (A).

(2) Remove the A/C head with head base.

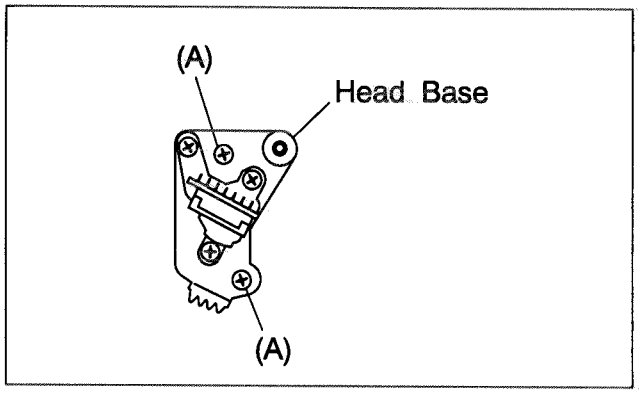


Fig.2-5-2

(3) When replacing the A/C head only,remove 3 screws (B), use care not to misplace the 3 springs.

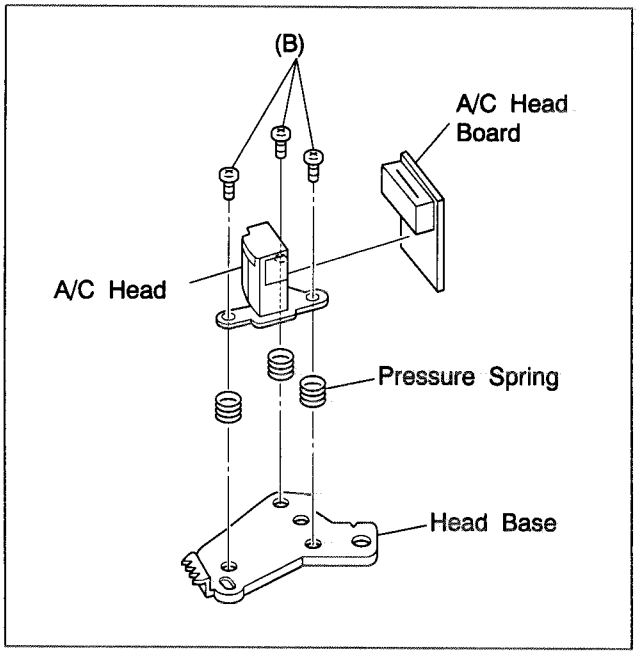


Fig.2-5-3

2. Installation

(1) Temporarily set A/C head height as indicated in Fig. 2-5-4.

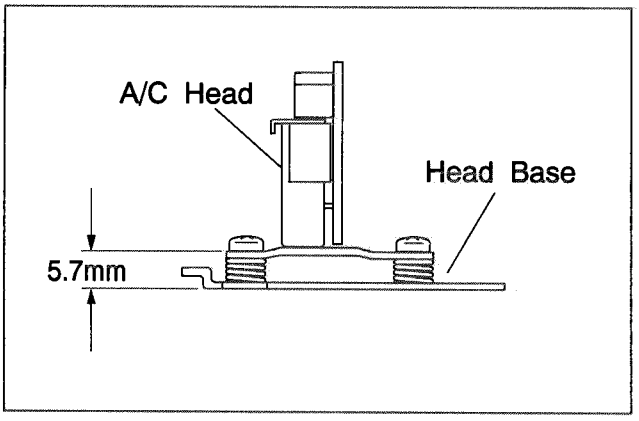


Fig.2-5-4

NOTES:

- *It is very important to correctly adjust the control pulse and audio signal in addition to the mechanical tape path.*
- *Perform interchangeability adjustments after electrical adjustments.*

2.5.3 Pinch Plate

1. Removal

(1) Disengage 2 claws, then remove the pinch plate.

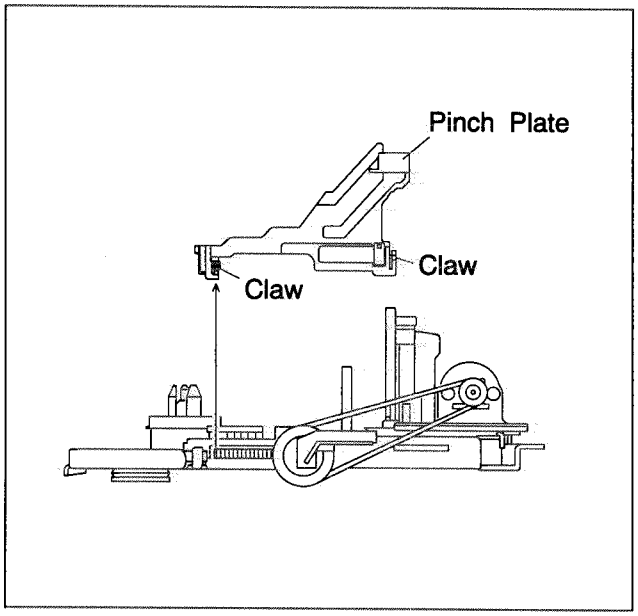


Fig.2-5-5

2. Installation

(1) When installing pinch plate,align rack of pinch plate and triangle mark of control cam as indicated in Fig.2-5-6.

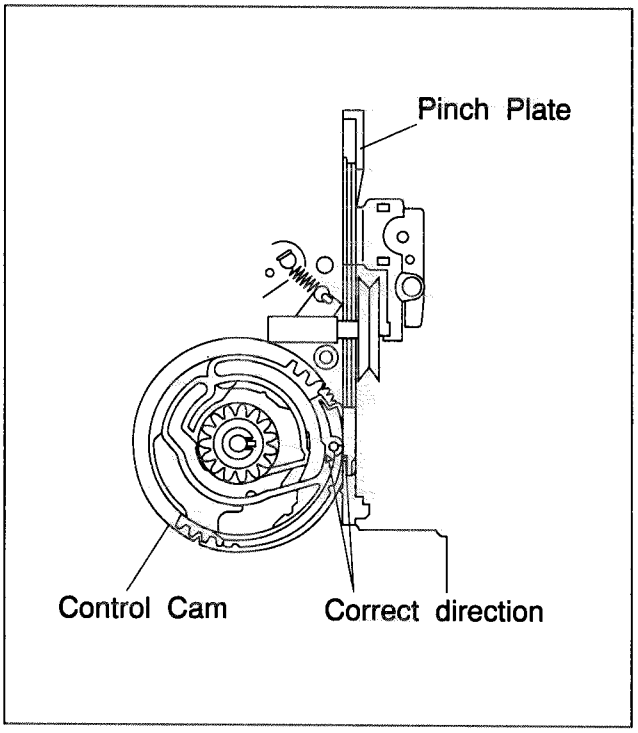


Fig. 2-5-6

2.5.4 Mode Motor

(1) Engage the belt between mode motor and worm gear.
(2) Take out 2 screws (A) then remove the mode motor.

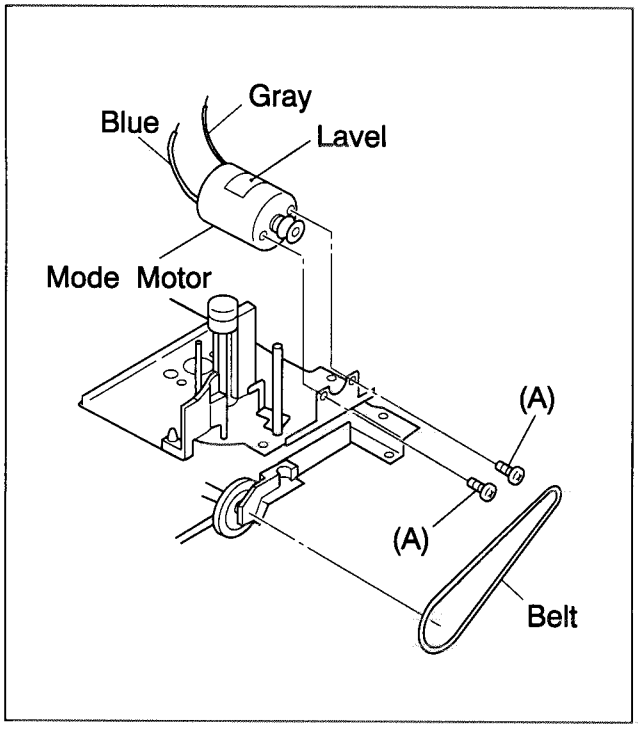


Fig.2-5-7

2.5.5 Lever Assy,Sub Deck Assy,Capstan Motor

(1) Take out 1 slit washer,then remove the lever assy.
(2) Engage the belt(capstan motor) from bottom of mechanism assy first as indicated in Fig.2-5-10.
(3) Take out 3 screws (A) and remove the sub deck assy as indicated in Fig.2-5-8.
(4) Take out 3 screws (B) and remove the capstan motor from the sub deck assy as indicated in Fig.2-5-9.

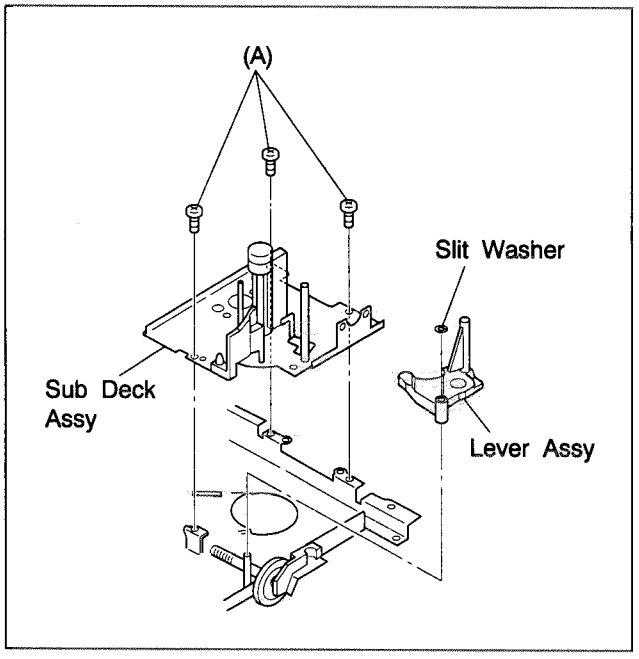


Fig.2-5-8

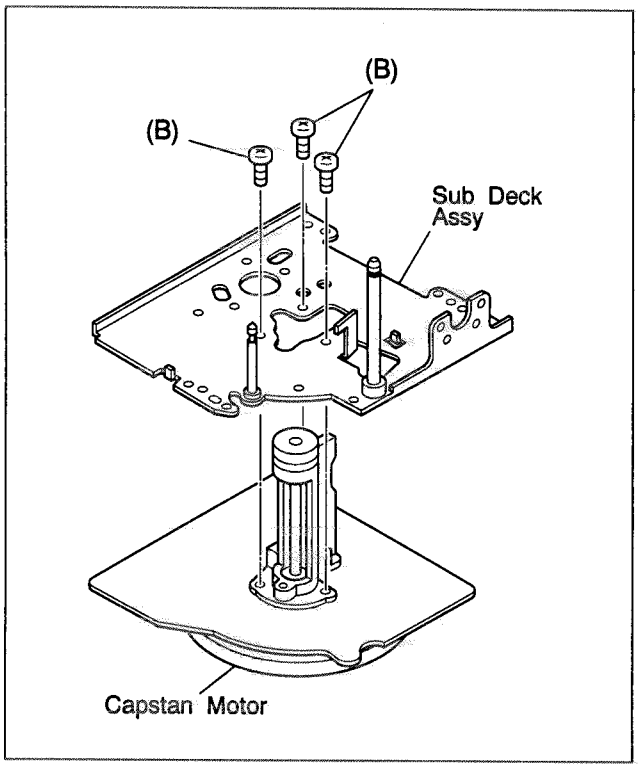


Fig.2-5-9

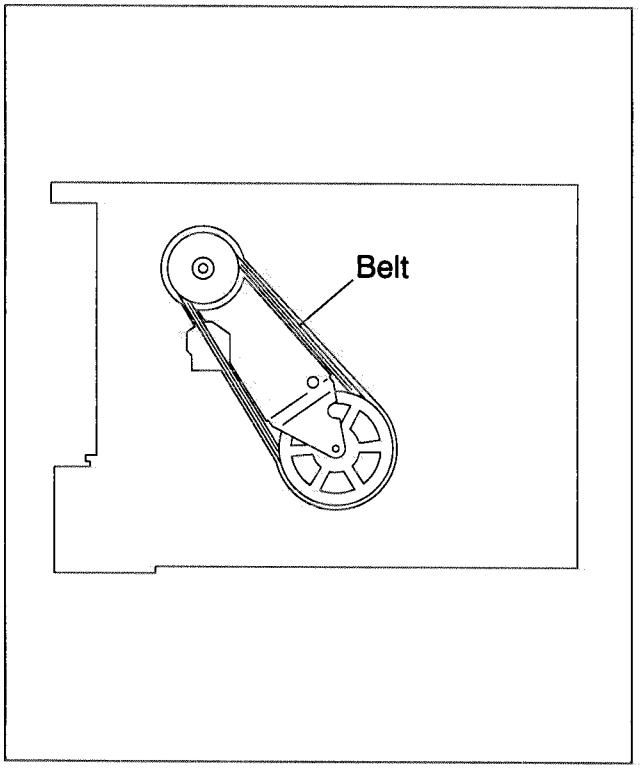


Fig.2-5-10

2.5.6 Control Bracket-1,Earth Pllate

(1) Take out 1 screw (A) and 1 screw (B).
(2) Remove the control bracket-1 and earth pllate.

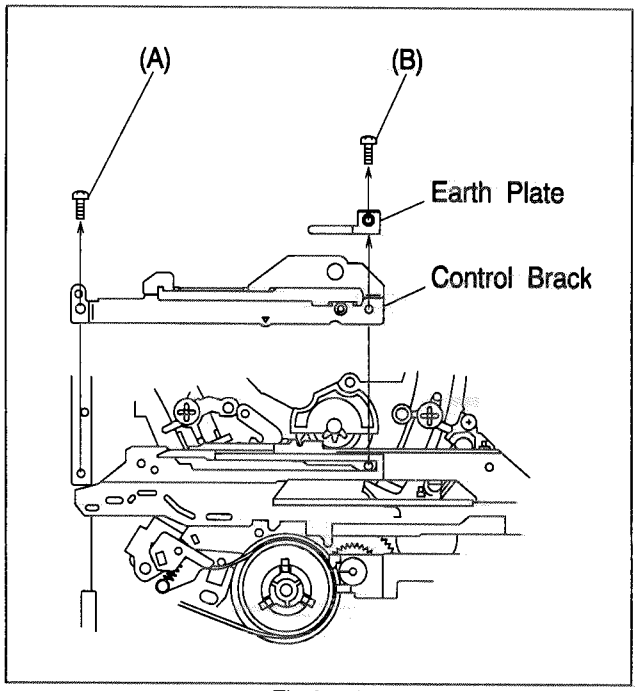


Fig.2-5-11

2.5.7 Reel Bracket,Slit disk (take-up)

(1) Take out 2 slit washers.
(2) Remove the reel bracket and slit disk(take-up).

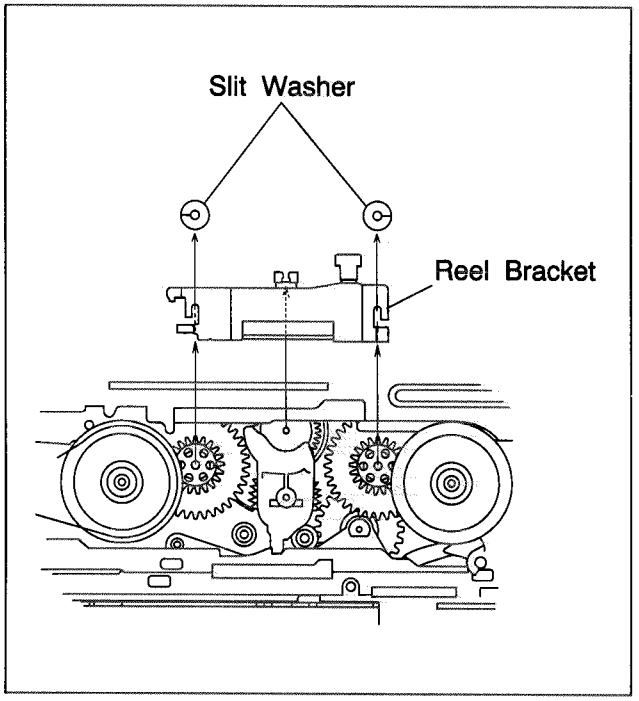


Fig.2-5-12

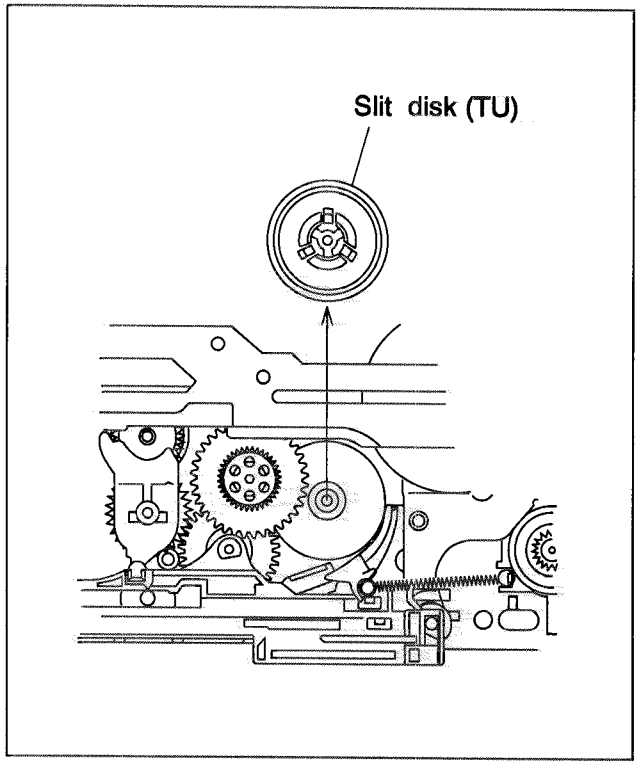


Fig.2-5-13

2.5.8 Control Bracket-2,Control Plate

(1) Take out 1 screw (A) and remove the control bracket-2.
(2) Take out 1 slit washer.
(3) Disengage 2 claws and remove the control plate.

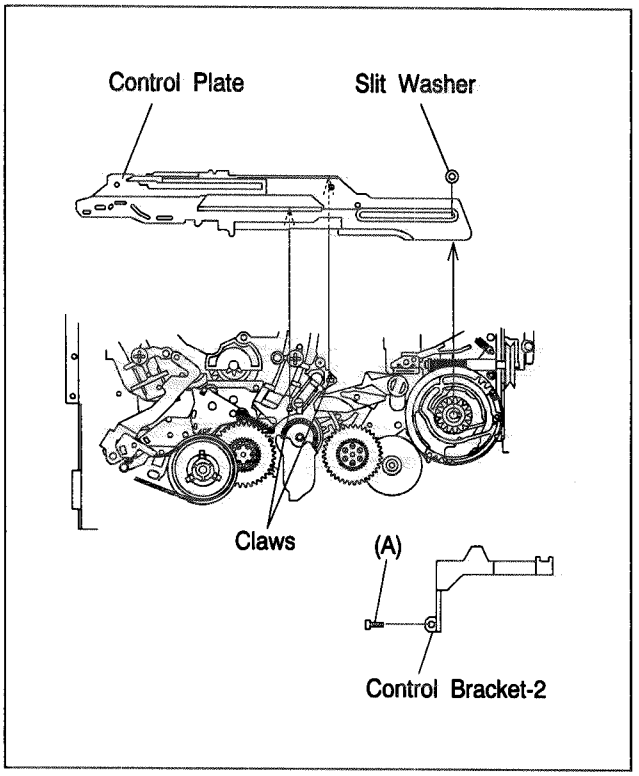


Fig.2-5-14

2.5.9 Sub Brake(take-up),Control Cam

(1) Disengage 1 spring (a) and 1 claw then remove the sub brake (take-up).
(2) Disengage 1 claw and remove the control cam.

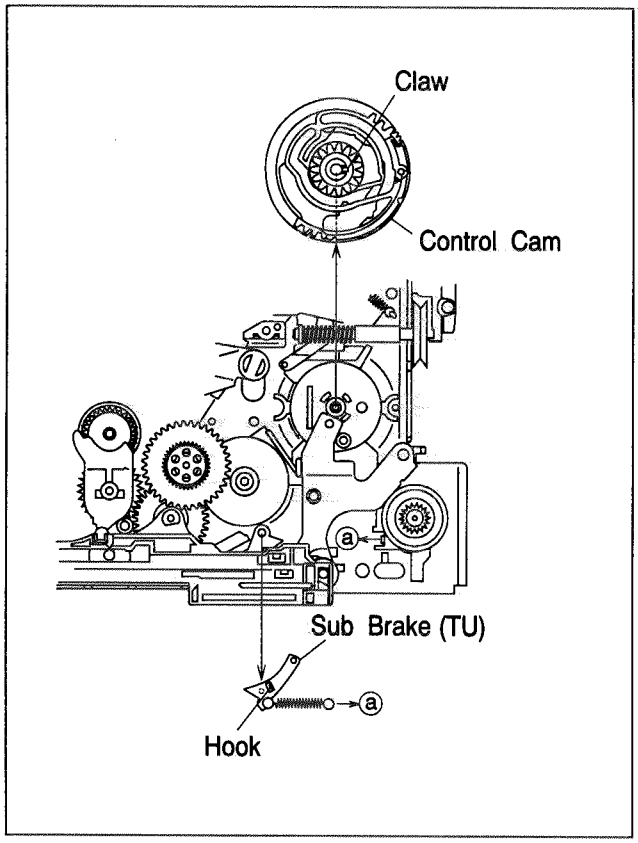


Fig.2-5-15

2.5.10 Slide Plate

(1) Disengage 7 claws from bottom of the mechanism assy and remove the slide plate.

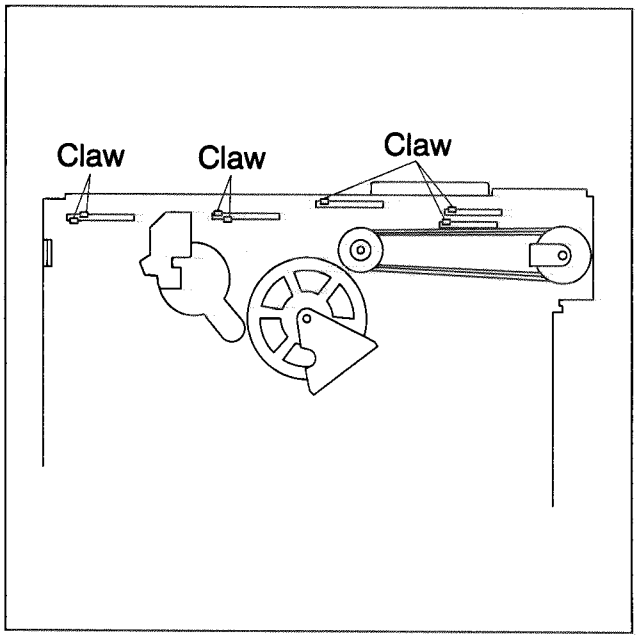


Fig. 2-5-16

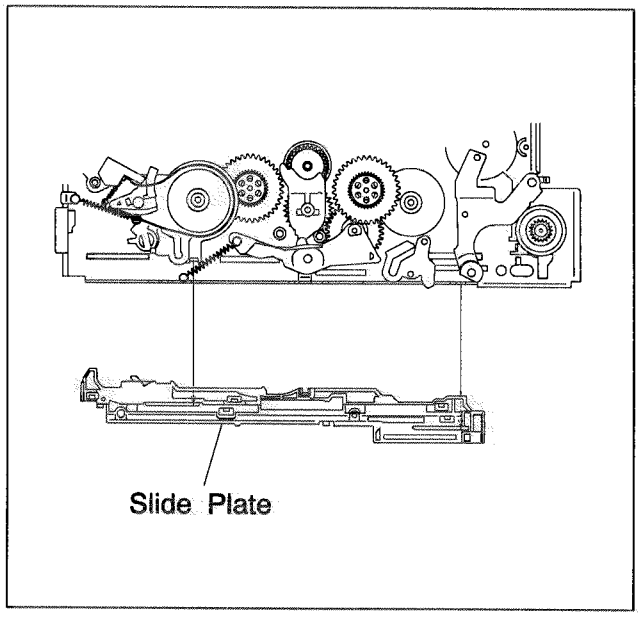


Fig. 2-5-17

2.5.11 Change Lever,Rotary Encoder

(1) Remove the change lever.
(2) Disengage 2 claws and remove the rotary encoder.

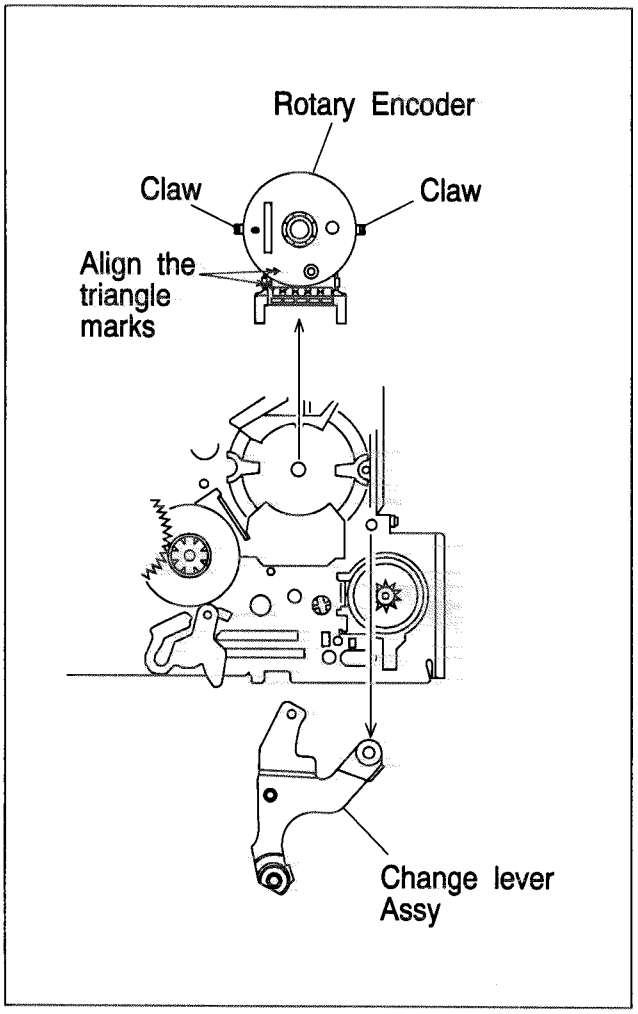


Fig. 2-5-18

2.5.12 Sub Brake (supply),Tension Band Assy,Tension Arm Assy,Take-up Lever Assy,Slit Disk(supply)

(1) Disengage 1 spring (a).
(2) Disengage 1 claw and remove the sub brake (supply).
(3) Take out 1 screw (A),spring (c) and slit washer.
(4) Remove the tension arm assy with tension band assy.
(5) Disengage 1 spring (b) and remove the take-up lever assy.
(6) Remove the slit disk(supply).

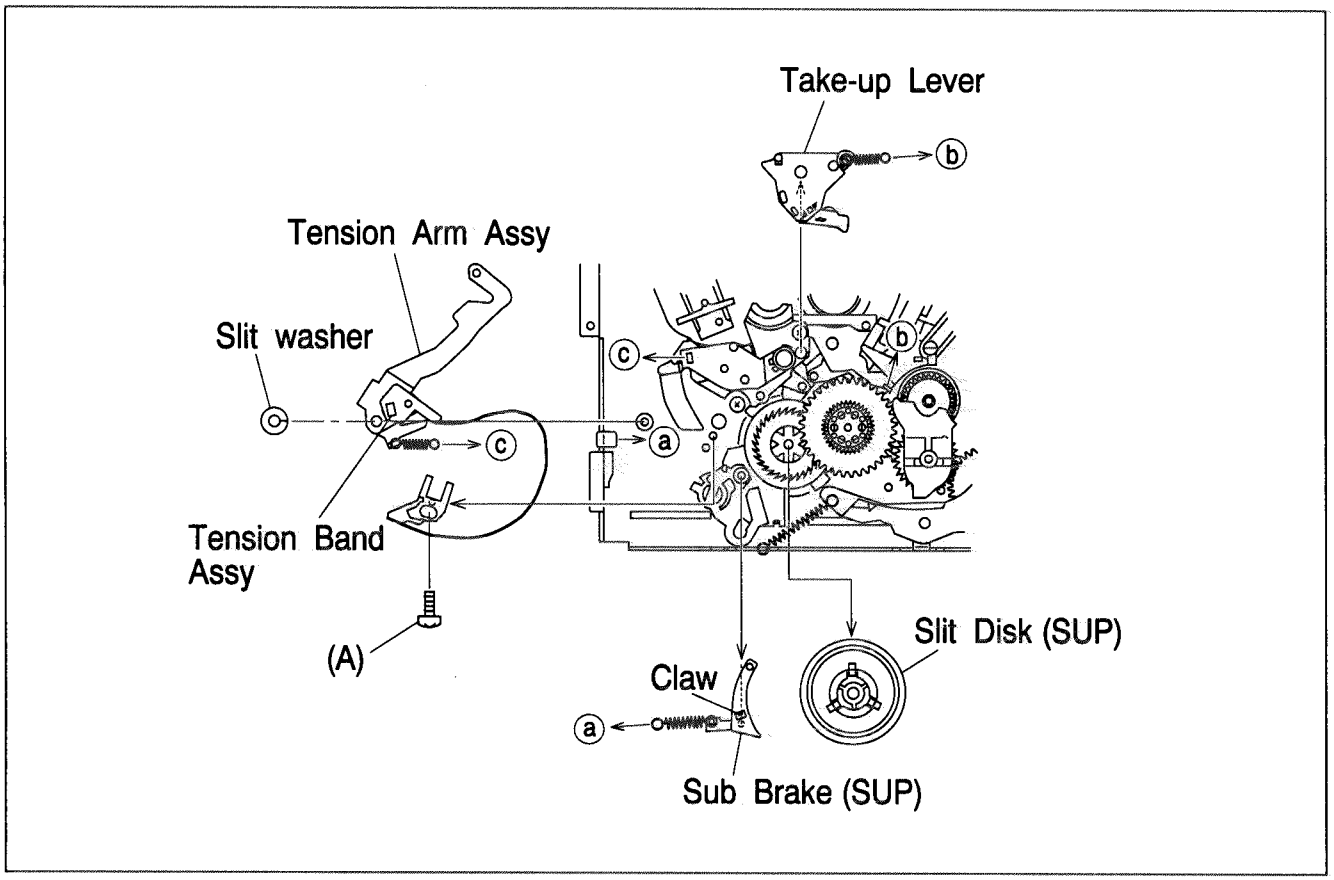


Fig. 2-5-19

2.5.13 Take-up Head,Tension Arm Lever

(1) Remove the take-up head and tension arm lever.

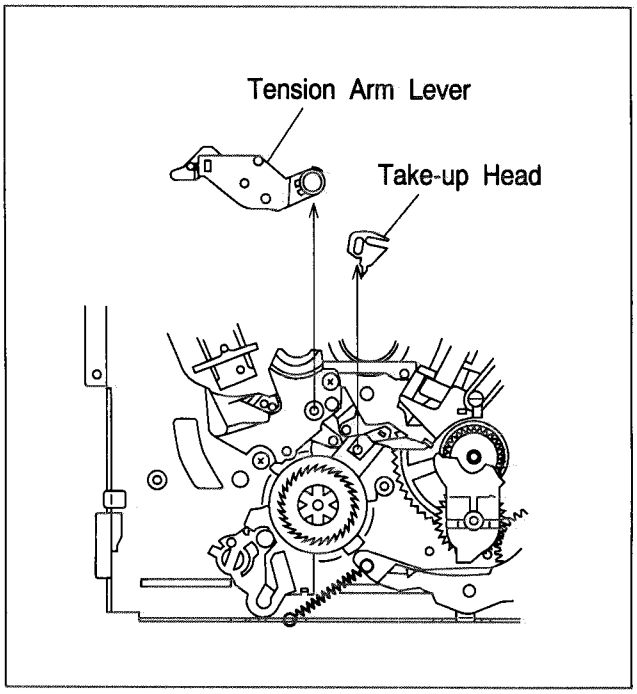


Fig.2-5-20

2.5.14 Guide Rail

(1) Take out 5 screws (A) and 1 screw (B).
(2) Disengage 4 claws and remove the guide rail.

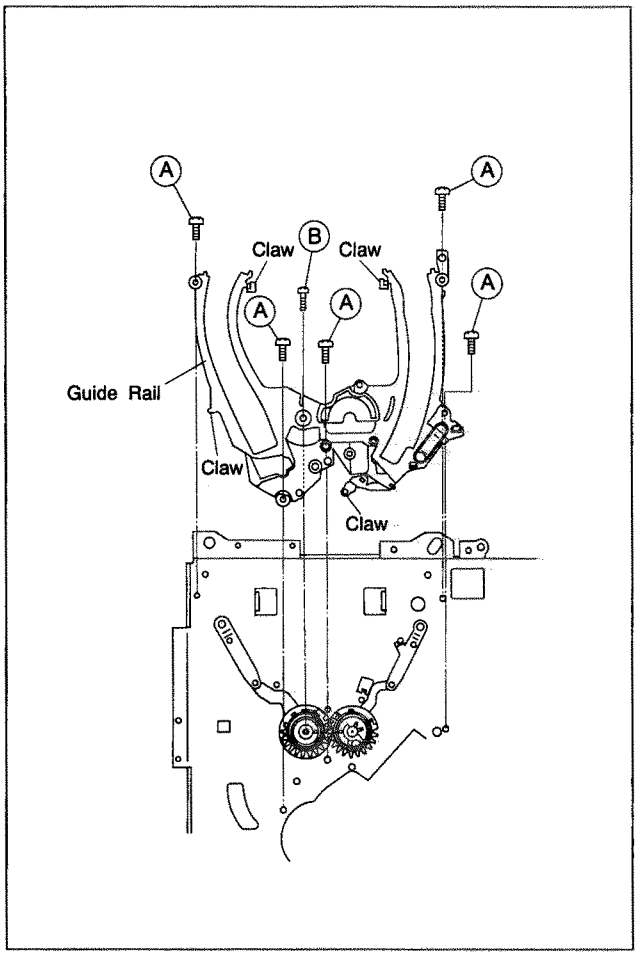


Fig. 2-5-21

2.5.15 Stator Assy

(1) Take out 2 screws (A).
(2) Raise the stator assy in the direction indicated by the arrow to remove it (also remove the inertia roller).
(3) Remove the flat cable.
(4) To reinstall,first secure the flat cable,then insert 2 screws (A).
(5) After reinstalling, be sure to perform PB switching point adjustment(See SECTION 3 ELECTRICAL ADJUSTMENT).

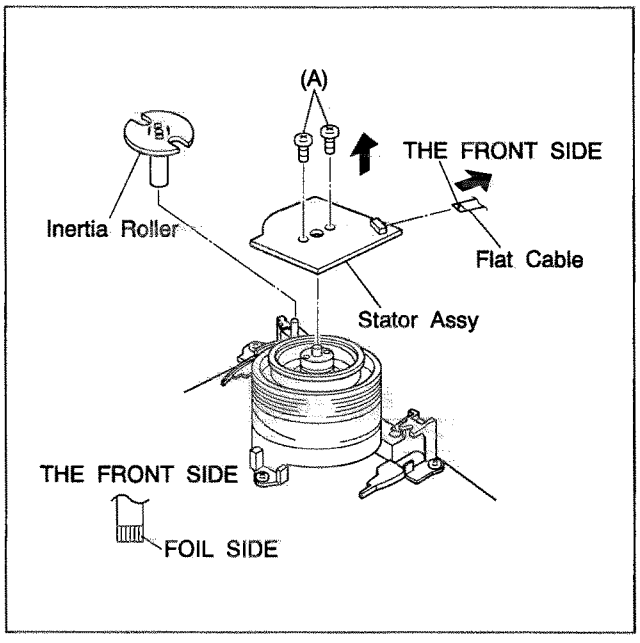


Fig. 2-5-22

NOTE : *When refitting the connector, check that the flat wire is inserted correctly.*

2.5.16 Rotor Assy

(1) Remove the stator assy.
(2) Take out 2 screws (B) and remove the rotor assy.

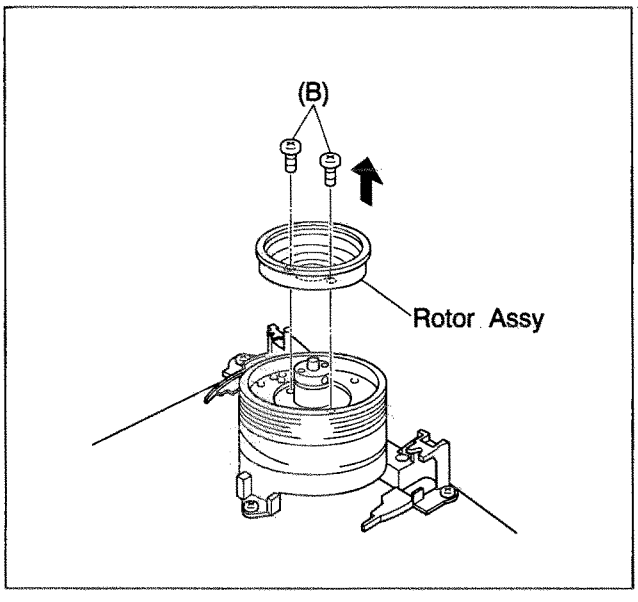


Fig.2-5-23

(3) Align the upper dum assy and rotor assy phase as indicated in Fig.2-5-22.
(4) Overlap holes (a) of the upper drum assy with holes (b) of the rotor assy (align holes in 3 locations) and secure with 2 screws (B) as indicated in Fig.2-5-21.

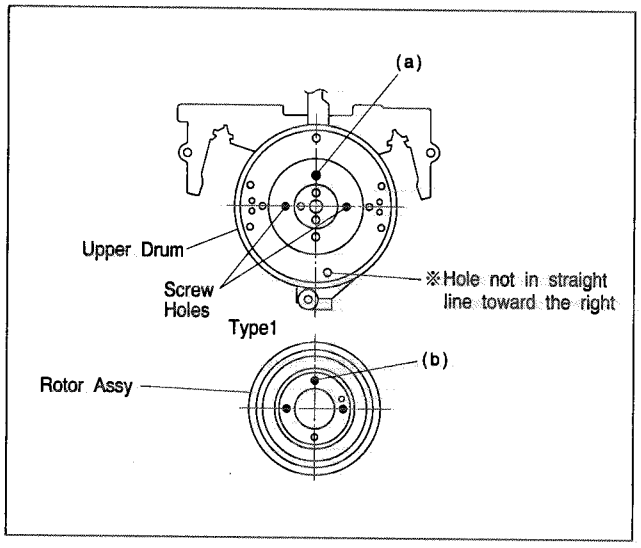


Fig. 2-5-24

2.5.17 Upper Drum Assy

1. Removal

(1) Remove the stator assy and rotor assy.
(2) Use a 1.5 mm hexagonal wrench to loosen the collar assy screw and remove the collar assy.
(3) Remove the upper drum assy and use tweezers to remove the Washer.

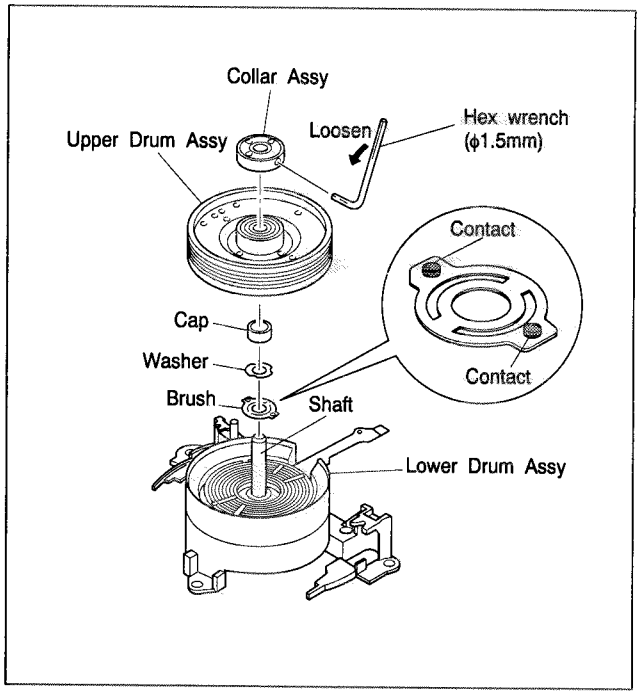


Fig. 2-5-25

NOTE : *If the Brush is replaced, do not apply the grease to the contacts.*

2. Installation

(1) Use an air brush to clean the lower drum assy and the coil section of the new upper drum assy.
(2) Set a new washer on the drum shaft as indicated in Fig.2-5-25.

NOTE : *Be sure to use the new washer when replace the upper drum assy.*

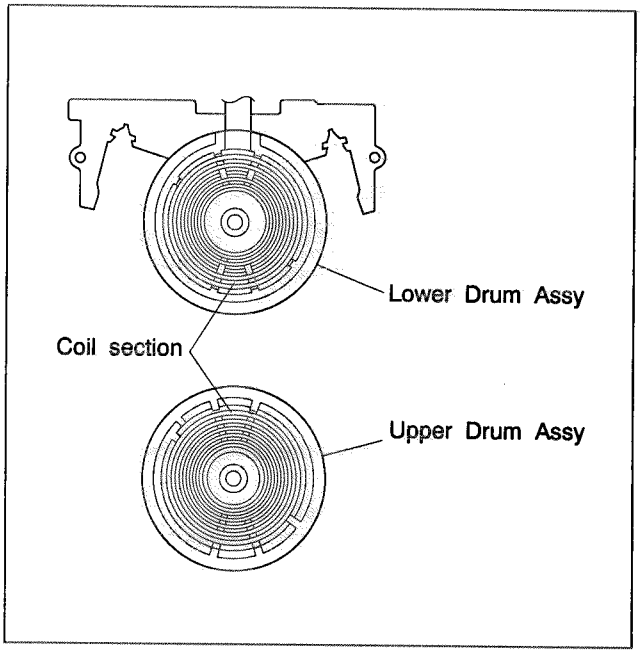


Fig.2-5-26

(3) Note the top and bottom of the collar assy and determine the position as indicated in Fig.2-5-25.

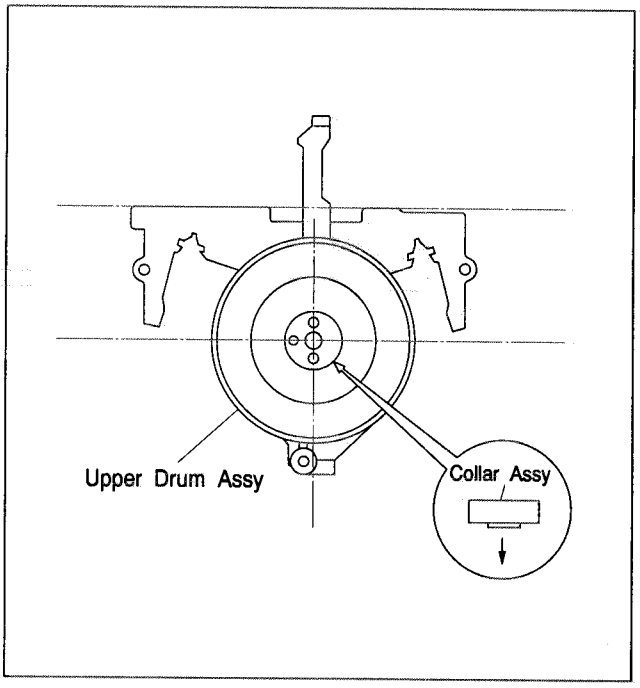


Fig.2-5-27

(4) While pressing the collar assy evently from above with your fingertips,secure the hexagonal screw.

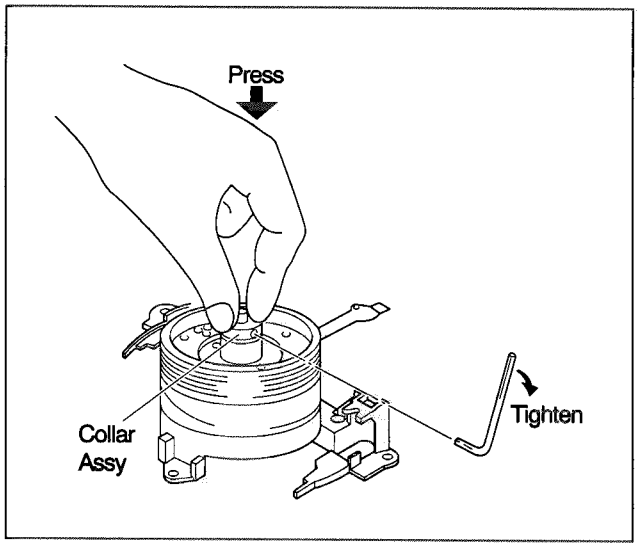


Fig.2-5-28

(5) After installing,gently turn the upper drum by hand and confirm normal rotation.
(6) Install the rotar assy and stator assy.
(7) Clean the upper and lower drum assies and perform the following adjustments;
- PB switching point adjustment
- Slow tracking preset adjustment
- Interchangeability adjustment (be sure to check LP mode)

2.6 CHECKUP AND ADJUSTMENT OF MECHANISM PHASE

2.6.1 Precaution

The rotary encoder and syscon circuit are closely interrelated.Therefore,the rotary encoder and control cam conection determines the operations of mechanical parts such as plates,gears,brakes,etc.Correct positioning of these parts is essential for smooth tape loading and mechanical operations.

2.6.2 Loadidg Arm Assy (supply,take-up)

(1) Install the supply loading arm assy and the take-up loading arm assy so that their positioning markings on the respective gear face each other and the holes of their arms correspond to the holes on the main deck assy respectively.
(2) After setting the guide rails,engage the pole base assies with the tip of the loading arms respectively. Then,enter the mechanism into the unloading mode to return the pole base assies to the front position.
(3) Reassemble the peripheral parts of the guide rail as originally.

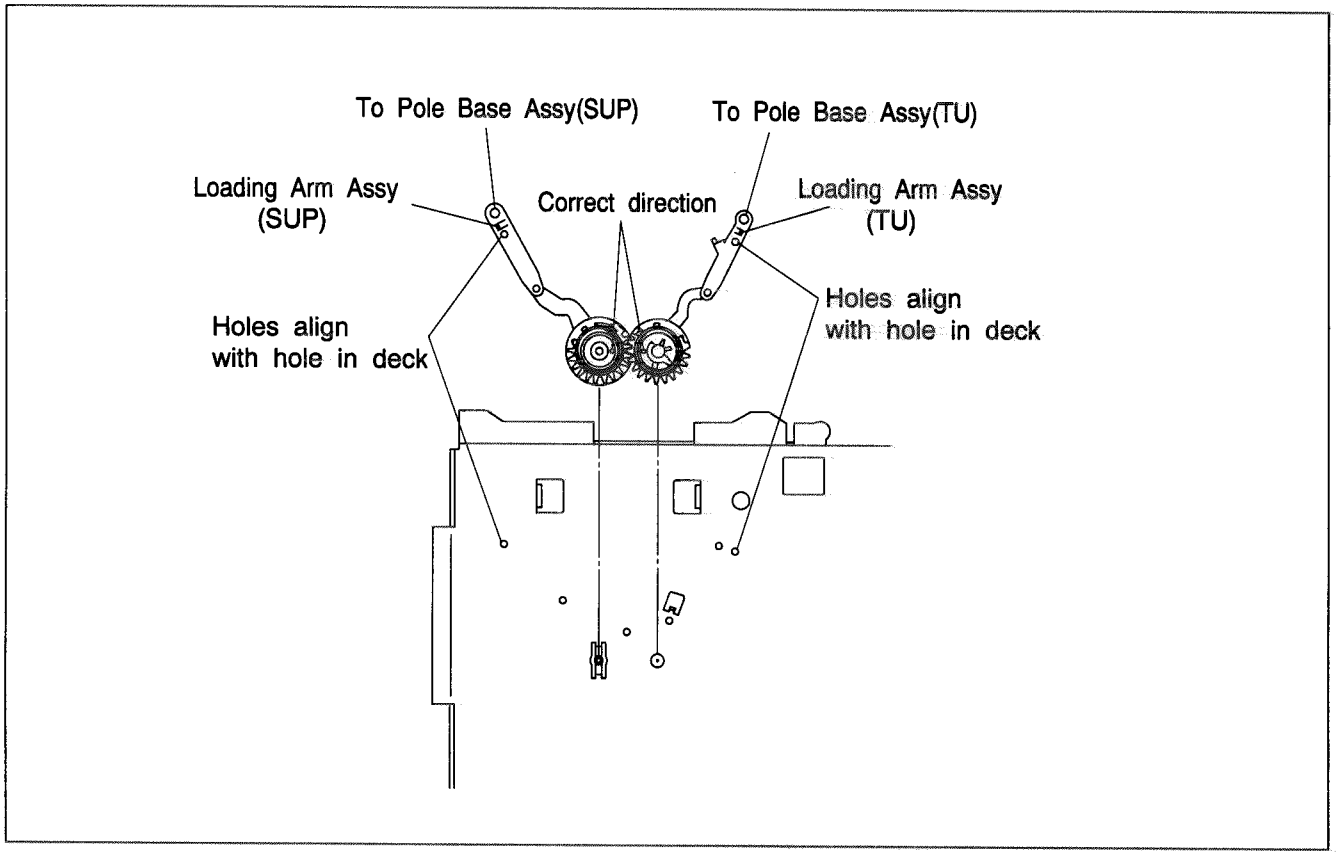


Fig. 2-6-1

2.6.3 Rotary Encoder,Change Lever,Control Cam

(1) When reinstalling the rotary encoder,adjust its position so as to fit the triangle marks each other and push it deep untill it is locked by the pawls.
(2) When reinstalling the change lever,set it so as to make its positioning hole correspond to the hole of the main deck assy.
(3) When re-engaging the control cam,lower the capstan brake assy while setting it so as to make its positioning hole correspond to the hole of the main deck assy.

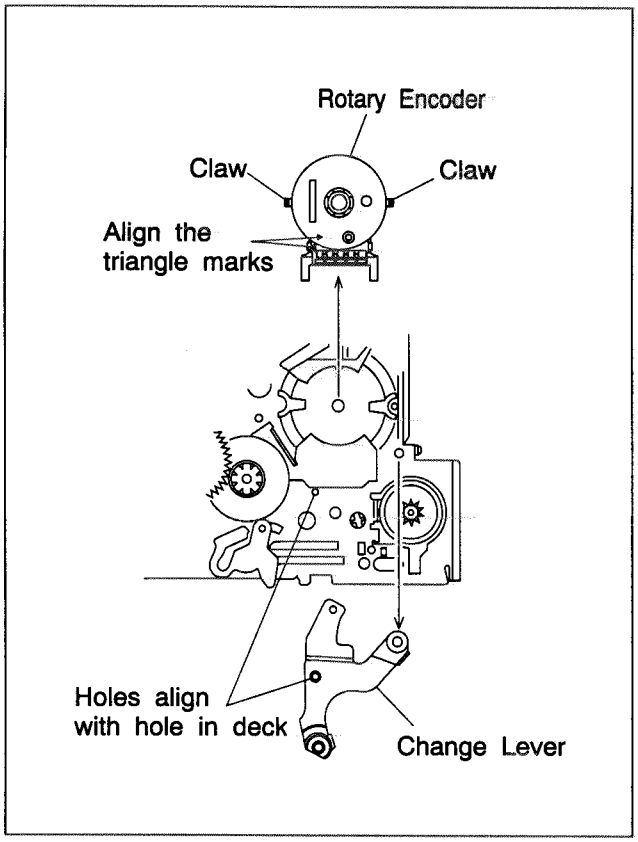


Fig. 2-6-2

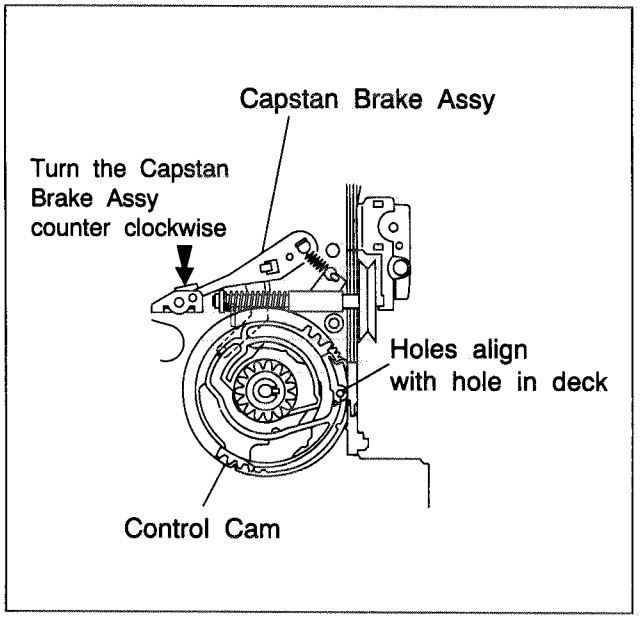


Fig. 2-6-3

2.6.4 Slide Plate

(1) Lower both the main brake assies (supply and take-up) untill they touch the edge of the main deck assy while reinstalling the slide plate so as to make the respective positioning holes of the main brake assies correspond to the holes on the main deck assy.

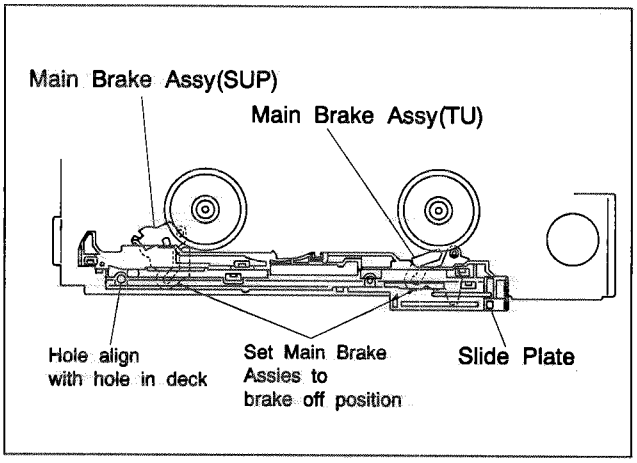


Fig.2-6-4

2.6.5 Control Plate

(1) Reinstall the control plate so as to set the two positioning holes of it on the holes on the main deck assy respectively and to set the positioning hole of the take-up lever on the hole of the main deck at the same time. When adjusting the hole position of the take-up lever,use a pair of tweezers to hold and move it since it is pulled by a tension spring.
(2) After reinstalling the control plate,fix it with the slit washer,control bracket-1 and -2.

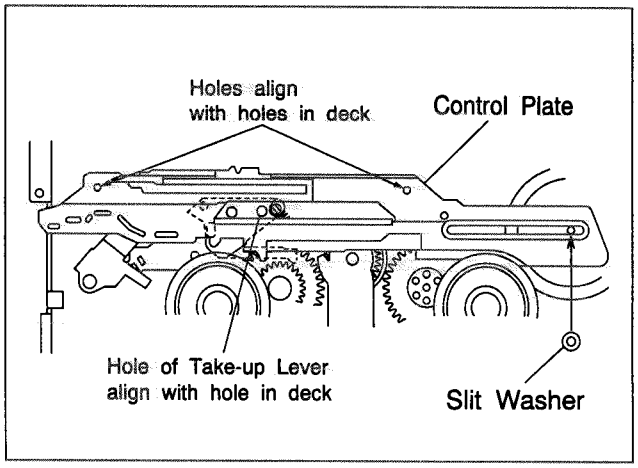


Fig. 2-6-5

2.7 TAPE INTERCHANGEABILITY ADJUSTMENT

NOTE : • *This adjustment is extremely important. However, it is normally not required during routine service. Perform only after replacing major components(A/C head,upper/lower drum assy,pole base assy,etc).*

• *Before using costly alignment tape,use a spare tape and confirm correct operation of the tape transport.*

2.7.1 Tape pattern

(1) Connect the oscilloscope to TP6(PB FM) on the PRE/REC board.Use TP11(D.FF) on the PRE/REC board as a trigger.

(2) Playback the SP stairstep portion of the alignment tape [MHPE].Confirm that the FM waveform appears as indicated in Fig.2-7-1.

(3) Set the manual tracking position by simultaneously pressing the TV PROG. "–" and "+" buttons.

(4) Operate the tracking adjustment (press the TV PROG. buttons during playback) and set for maximum playback FM waveform.

(5) By operating the TV PROG. button,vary the FMwaveform from maximum to minimum and vice versa to confirm that the waveform varies nearly in a flat shape as shown in Fig.2-7-1.

(6) When the FM waveform does not remain flat during this process,first slightly loosen the set screw located at the bottom of the guide rollers.Using the guide roller adjustment tool (Roller driver) ,adjust the supply and take-up guide rollers (refer to Fig.2-7-2) to obtain the correct waveform as indicated in Fig.2-7-3.

(7) By pressing the TV PROG. buttons several times,vary the FM waveform output from maximum to minimum (and vice versa) gradually,and confirm that the variation proceeds in flat shape, as shown in Fig.2-7-3.

(8) Next playback the LP stairstep portion of the alignment tape [MHPE-L] and adjust the tracking control from maximum to minimum the FM waveform,confirm that FM waveform variation is always flat.

(9) Record the signal and play it back in both of the SP and LP mode,confirm that the FM waveform is flat in both mode.

(10) After adjustments,tighten the set screw of the guide rollers.

(11) Confirm that the tape wrinking does not occur at the roller upper or lower limits as indicated in Fig.2-7-4.

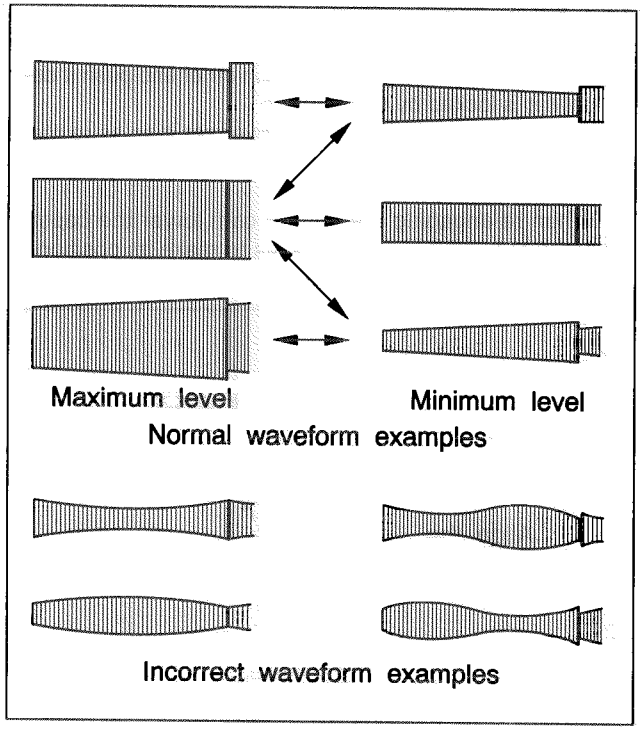


Fig. 2-7-1

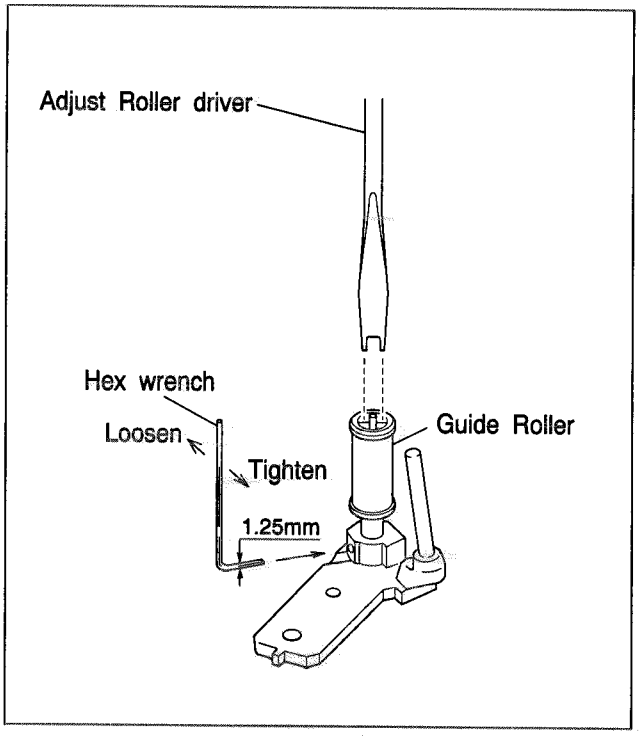


Fig. 2-7-2

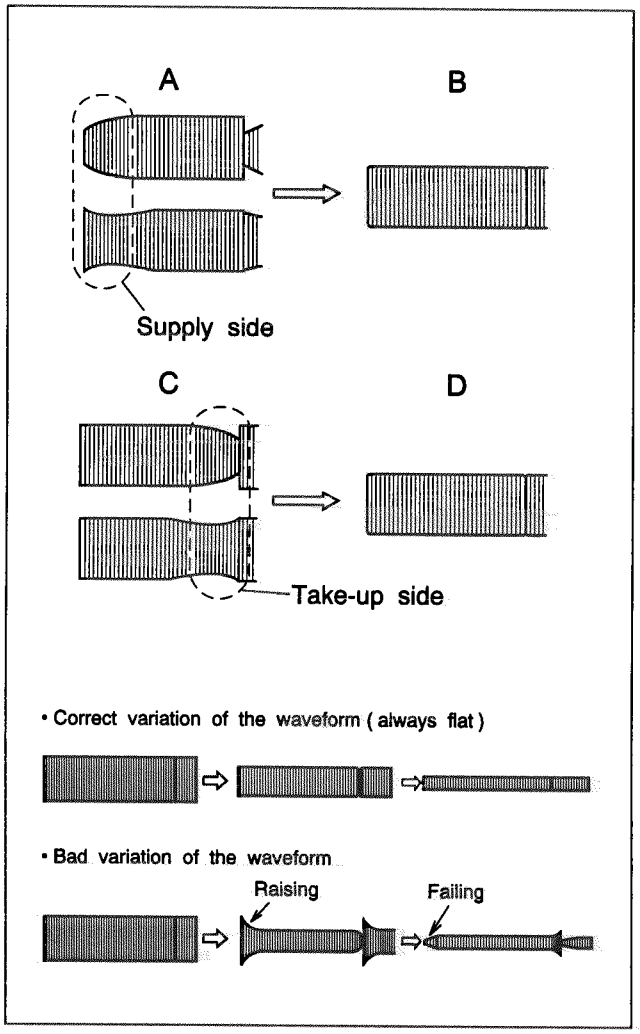


Fig. 2-7-3

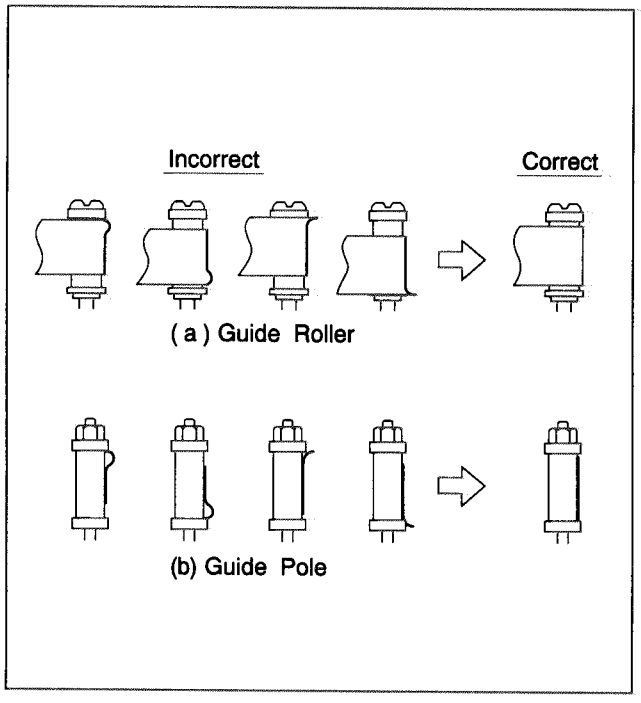


Fig. 2-7-4

2.7.2 A/C head height & azimuth

NOTE : • *Temporarily set A/C head height as indicated in Fig. 2-5-4.*
• *Use spare tape to check the transport and confirm the tape is not scratched or damaged.*

1. Tilt

(1) Use spare tape and set for playback.
(2) Turn screw (3) clockwise to where the tape curls just slightly at the TU guide pole bottom flange as shown in Fig.2-7-5.
(3) Then slowly turn screw (3) counterclockwise to where the curling ceases.

2. Height

(1) Connect CH-1 of a dual trace oscilloscope to Audio Out.
(2) Connect CH-2 to TP401(CTL PULSE) of the Main board assy and use the ALT mode.
(3) Playback the SP stairstep portion of the alignment tape [MHPE].
(4) Adjust screws (1),(2) and (3) for maximum audio output and control pulse level.

3. Azimuth

(1) Connect the oscilloscope to Audio Out.
(2) Playback the SP stairstep portion of the alignment tape [MHPE].
(3) Adjust screw (2) so that the audio output is both maximum and with minimum fluctuation.

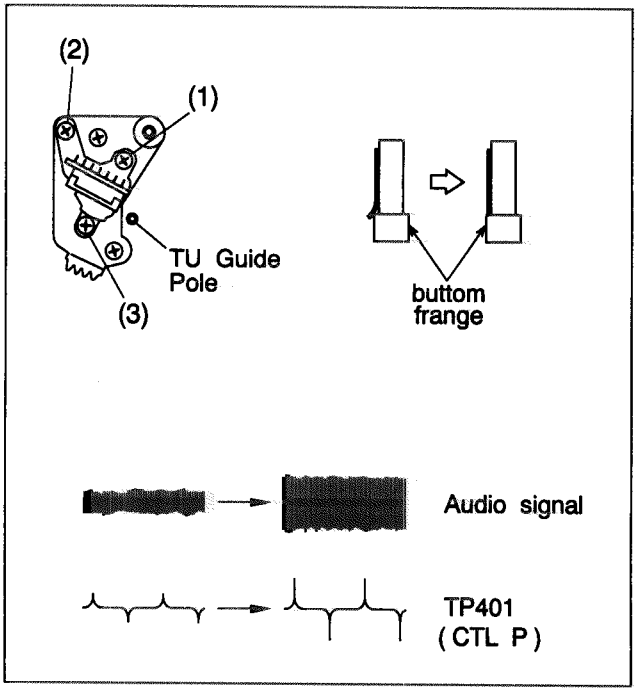


Fig. 2-7-5

2.7.3 A/C head phase(X-value)

(1) Connect the oscilloscope to TP6(PB FM) on the PRE/REC board.Use TP11(D.FF) on the PRE/REC board as a trigger.
(2) Playback the SP stairstep portion of the alignment tape [MHPE].
(3) Set the neutral manual tracking position by simultaneously pressing the TV PROG. "–" and "+" buttons.
(4) If adjustment is required,slightly loosen screws (4) and (5). Set A/C head positioning tool on the A/C head adjusting boss as indicated in Fig.2-7-6.
(5) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig.2-7-7.
(6) Tighten screw (5). Remove the tool and tighten screw (4).
(7) Eject the SP alighnment tape [MHPE] and then re-insert the LP alignment tape [MHPE-L].
(8) Playback the LP stairstep portion of the alignment tape [MHPE-L].
(9) Set the neutral manual tracking position by simultaneously pressing the TV PROG. "–" and "+" buttons.
(10) Confirm maximum playback FM waveform output level as shown in Fig.2-7-7.
(11) If not maximum,slightly loosen the screws (4) and (5). Use the tool and adjust the head position for the nearest maximum point. Then tighten screws (4) and (5).

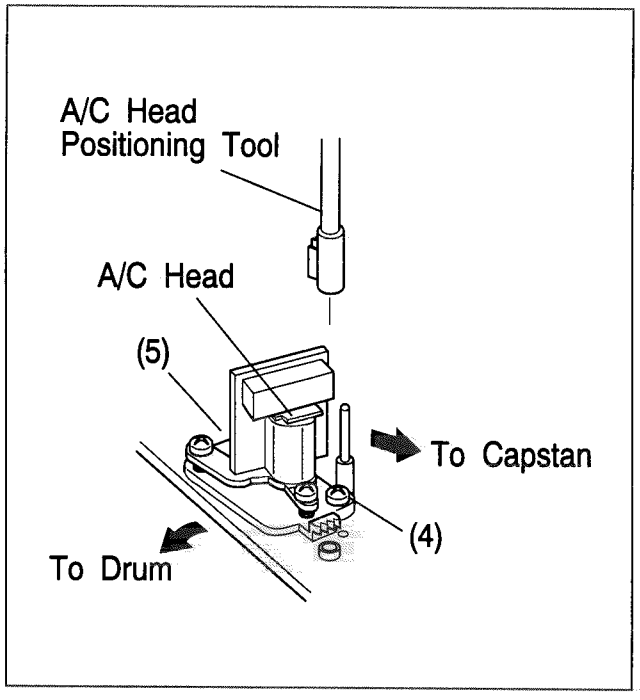


Fig. 2-7-6

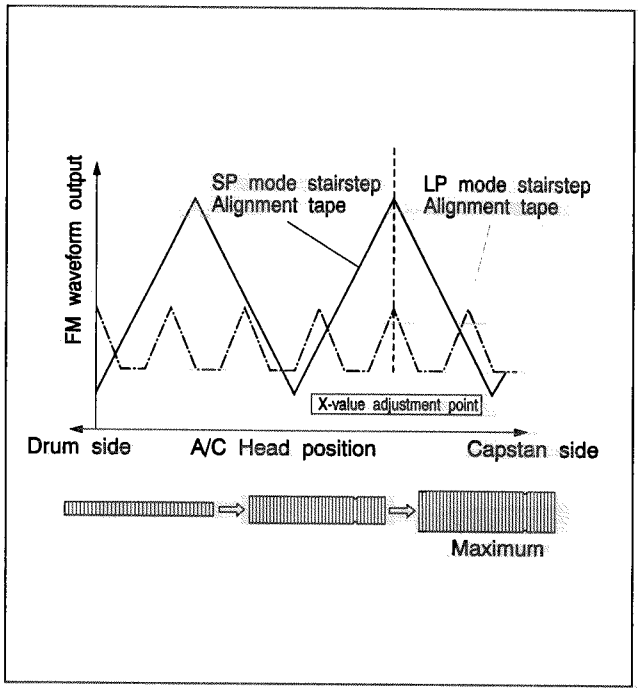


Fig. 2-7-7

2.7.4 LP mode auto tracking

NOTE : *Set VCR to the mode A by remote controller.*

(1) Connect the oscilloscope to TP6(PB FM) on the PRE/REC board.Use TP11(D.FF) on the PRE/REC board as a trigger.
(2) Playback the LP stairstep portion of the alignment tape [MHPE-L].
(3) Confirm the FM waveform of the oscilloscope screen until auto tracking action is over.
(4) Twice press button "D" of the presetting unit [PTU94008].
(5) If the alignment tape ejects automatically,repeat the A/C head phase adjustment (X-value).

2.7.5 Tension pole position

(1) Set for playback mode using MECHANISM SERVICE MODE(See SECTION 1 DISASSEMBLY).
(2) Slightly loosen the screw (A) .
(3) Turn the adjust pin so that the tension arm assy does not touch ϕ2.5 pole on the outside.
(4) Tighten the screw (A).
(5) After adjustment,use the back tension cassette gauge and set for the playback mode.
(6) Confirm reading of 35 to 48 g•cm.

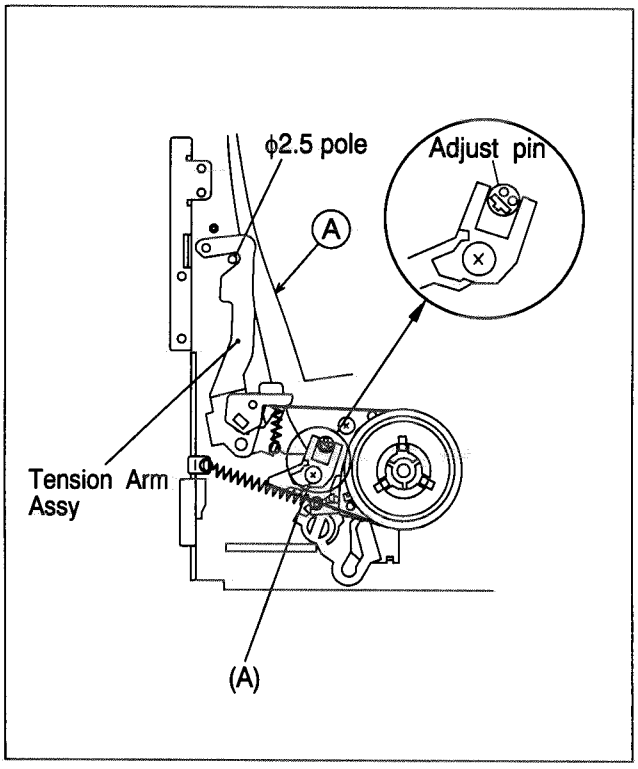


Fig. 2-7-8

2.7.6 Take-up torque

(1) Use the back tension cassette gauge and set for the playback mode.
(2) Confirm reading of 60 to 100 g•cm.

SECTION 3
ELECTRICAL ADJUSTMENT

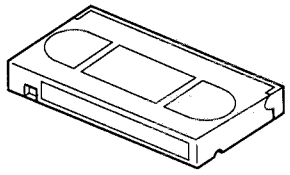
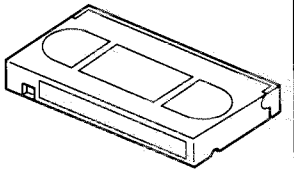
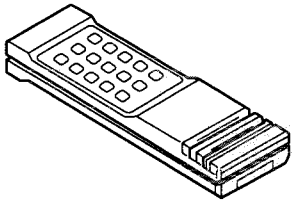
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

① Colour television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Digital voltmeter
⑤ Signal generator: RF/IF sweep/maker
⑥ Signal generator: PAL colour bar, stairstep
⑦ Recording tape
⑧ Digit-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE	Alignment tape (SP,colour bar) MHVE-2
	
Presetting unit PTU94008	
	

3.1.3 Colour bar signal,colour bar pattern

● Colour bar signal

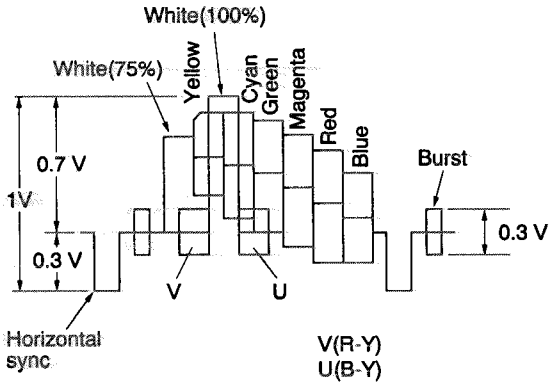


Fig.3-1-1 Colour bar signal waveform

● Colour bar pattern

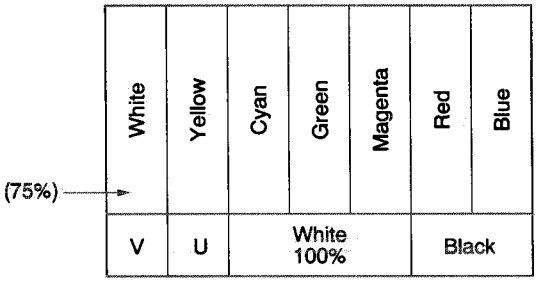


Fig.3-1-2 Colour bar pattern

3.2 SERVO CIRCUIT

Notes: • *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
• *Set VCR to the mode A by remote controller.*
• *Use only buttons "E" and "F", depressing other buttons during adjustment may cause adjustment errors.*

1. PB switching point

Signal	• Alignment tape [MHPE],Stairstep
Mode	• PB,Automatic tracking OFF
Equipment	• Oscilloscope
Measurement point	• JA501- pin 19 (VIDEO OUT)
Trigger slope (-)	• TP11(DRUM FF) , [PRE/REC BOARD]
Adjustment tool	• Presetting unit [PTU94008]
Specification	• 6.5 ± 0.5H

(1) Connect an oscilloscope to JA501- pin 19 (VIDEO OUT) and external trigger from TP11 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Set the tracking control to the centre position by simultaneously pressing the TV PROG "+" and "–" buttons.
(4) Adjust by pressing "E" or "F" buttons of presetting unit to position the trigger point 6.5 ± 0.5 H from V.sync.
(5) Depress the STOP button.

Alternate method
(1) Playback the stairstep signal of the alignment tape.
(2) Press the "O" button of presetting unit.
(3) Confirm that VCR mode becomes STOP mode.

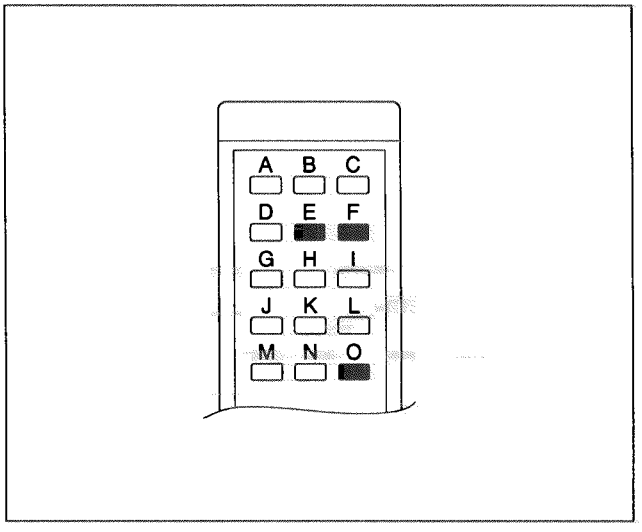


Fig.3-2-1 Presetting unit

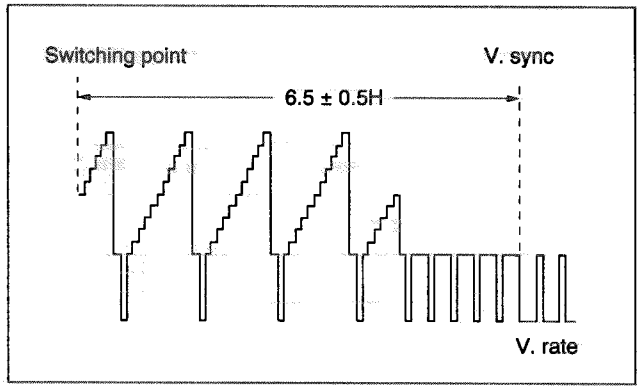


Fig.3-2-2 PB switching point

2. Slow tracking preset

Signal	• Tuner or colour bar
Mode	• SP, REC → PB(SLOW) Automatic tracking OFF
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note : *Set VCR to the mode A by remote controller. Use only buttons "B" and "C", depressing other buttons during adjustment may cause adjustment errors.*

(1) Record a colour bar signal in the SP mode.
(2) Playback recorded signal on the FWD slow mode.
(3) Set the tracking control to the centre position by simultaneously pressing the TV PROG "+" and "–" buttons.
(4) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing "B " or "C " buttons of the presetting unit.
(5) Depress the STOP button.
(6) Confirm that the bar noise is not visible on the TV monitor in the slow mode.

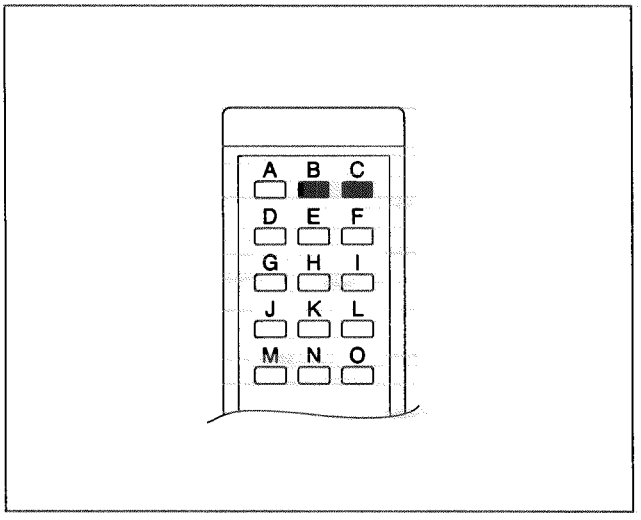


Fig.3-2-3 Presetting unit

3.3 VIDEO CIRCUIT

Notes: • *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
• *VIDEO circuit adjustments are performed by the EVR system by use of the presetting unit and numeric-key remote controller, so set VCR to the mode A by remote controller.*

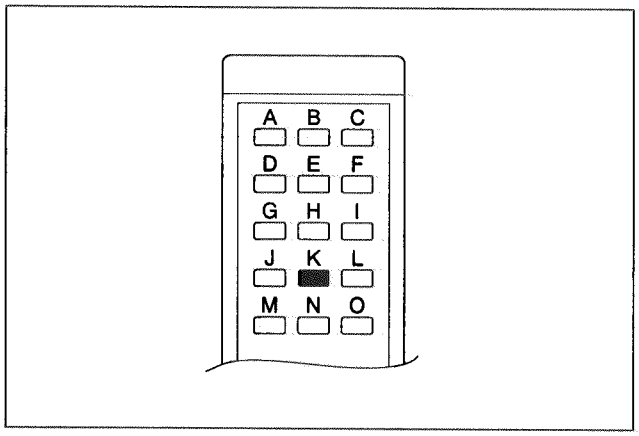


Fig.3-3-1 Presetting unit

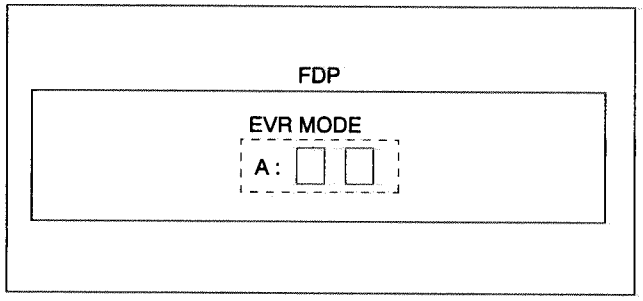


Fig.3-3-2 EVR mode

3.3.1 EE Y LEVEL

Signal	• Colour bar
Mode	• EE
Equipment	• Oscilloscope
Measurement point	• JA501- pin 19(VIDEO OUT)
Adjustment tool	• Presetting unit [PTU94008], numeric-key remote controller
EVR mode	• A : 11
Specification	• 1.00 ± 0.05Vp-p (terminate)

(1) Connect an oscilloscope to JA501- pin 19(VIDEO OUT).
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 11" pressing 1 numeric key twice of the remote controller.
(4) Adjust TV PROG "–" or "+" button for 1.00 ± 0.05Vp-p.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

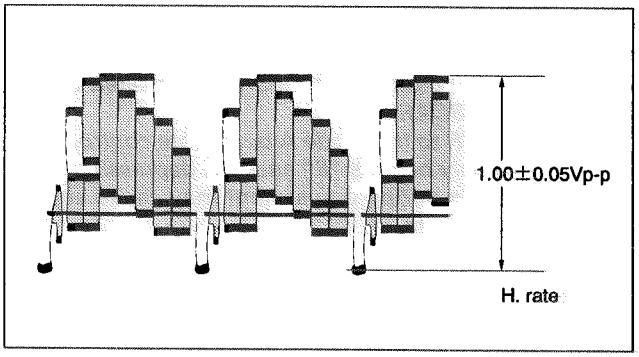


Fig. 3-3-3 EE Y level

3.3.2 WHITE/DARK CLIP

Signal	• Colour bar
Mode	• EE
Equipment	• Oscilloscope
Measurement point	• IC201 pin 13
Adjustment tool	• Presetting unit [PTU94008], numeric-key remote controller
EVR mode	• A : 14
Specification	• WHITE CLIP : 90 ± 4% DARK CLIP : 45 ± 8%

(1) Connect an oscilloscope to IC201 pin 13.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 14" pressing 1 and 4 numeric key of the remote controller.
(4) Adjust TV PROG "–" or "+" button for 90 ± 4% white clip and 45 ± 8% dark clip as shown in Fig.3-3-4.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

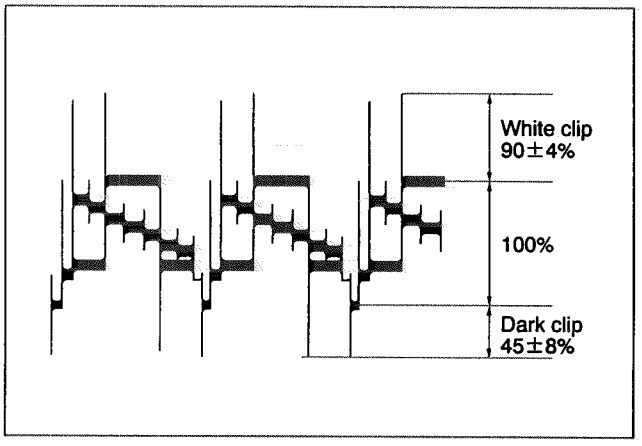


Fig.3-3-4 Whate/dark clip

3.3.3 CARRIER

Signal	• No signal-VIDEO INPUT
Mode	• EE
Equipment	• Frequency counter
Measurement point	• IC201 pin 19
Adjustment tool	• Presetting unit [PTU94008], numeric-key remote controller
EVR mode	• A : 12
Specification	• 3.80MHz ± 0.04MHz

(1) Connect an oscilloscope to IC201 pin 19.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 12" pressing 1 and 2 numeric key of the remote controller.
(4) Adjust TV PROG "–" or "+" button for 3.80MHz ± 0.04MHz.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.4 DEVIATION

Signal	• Colour bar
Mode	• REC then PB
Equipment	• Oscilloscope
Measurement point	• JA501- pin 19 (VIDEO OUT)
Adjustment tool	• Presetting unit [PTU94008], numeric-key remote controller
EVR mode	• A : 13
Specification	• 1.00 ± 0.05Vp-p (terminate)

(1) Connect an oscilloscope to JA501- pin 19(VIDEO OUT).
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 13" pressing 1 and 3 numeric key of the remote controller.
(4) Record and playback a colour bar signal.
(5) Before recording, Adjust TV PROG "-" or "+" button so that Y level becomes 1.00 ± 0.05Vp-p during playback as shown in Fig.3-3-5.
(6) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

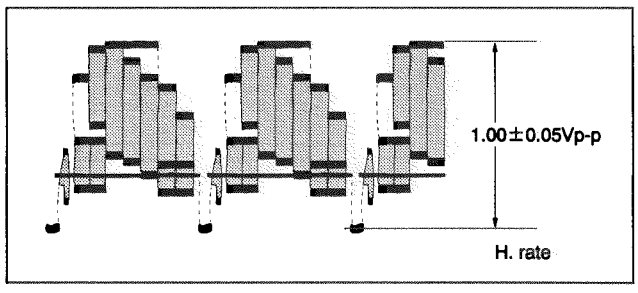


Fig.3-3-5 Deviation

3.3.5 REC COLOUR LEVEL

Signal	• Colour bar
Mode	• REC
Equipment	• Oscilloscope
Measurement point	• IC201 pin 33
Adjustment tool	• Presetting unit [PTU94008], numeric-key remote controller
EVR mode	• A : 2
Specification	• 250 ± 15mVp-p

(1) Connect an oscilloscope to IC201 pin 33.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 2" pressing 2 numeric key of the remote controller.
(4) Adjiust TV PROG "–" or "+" button for 250 ± 15mVp-p.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

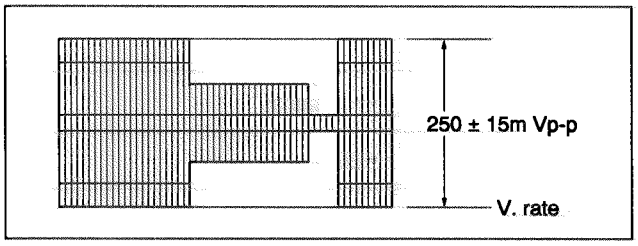


Fig.3-3-6 REC colour level

3.3.6 PB Y LEVEL

Signal	• Colour bar
Mode	• REC then PB
Equipment	• Oscilloscope
Measurement point	• JA501- pin 19 (VIDEO OUT)
Adjustment tool	• Presetting unit [PTU94008], numeric-key remote controller
EVR mode	• A : 11
Specification	• 1.00 ± 0.05Vp-p (terminate)

(1) Connect an oscilloscope to JA501- pin 19(VIDEO OUT).
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 11" pressing 1 numeric key twice of the remote controller.
(4) Record and playback a colour bar signal.
(5) Adjust TV PROG "–" or "+" button for 1.00 ± 0.05Vp-p as shown in Fig.3-3-7.
(6) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

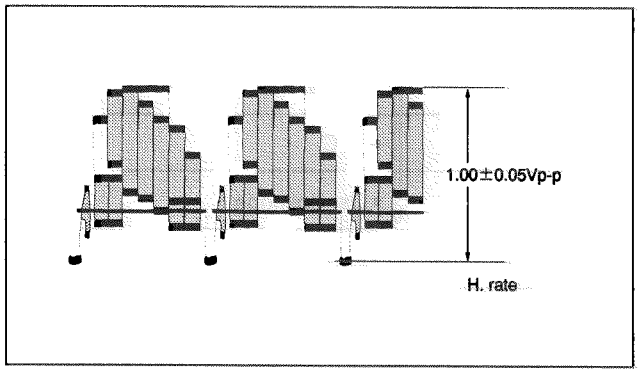


Fig.3-3-7 PB Y level

3.4 SYSCON CIRCUIT

Notes: • *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
• *When performing this adjustment,remove the MECHANISM assy.*

3.4.1 Timer clock

Signal	• No signal
Mode	• EE
Equipment	• Frequency counter
Measurement point	• IC601 pin 64
Adjustment part	• C601 (TIMER CLOCK)
Specification	• 1024.008 ± 0.001 Hz [976.5549 ± 0.0010 usec]

(1) Connect the frequency counter to IC601 pin 64 and GND.
(2) Connect the short wire between IC601 pin 33 and IC601 pin 63.
(3) Short the leads of capacitor C604 once in order to reset IC601.
(4) Disconnect the short wire then connect it again quickly.
(5) Adjust C601 for 1024.008 ± 0.001 Hz.
(976.5549 ± 0.0010 usec)

3.5 TUNER CIRCUIT

Note: *Unless otherwise specified, all measurement points and adjustment parts are located on the IF UNIT.*

3.5.1 RF AGC

Signal	• TV broadcasting
Mode	• Tuner
Equipment	• TV monitor
Measurement point	• IF UNIT
Adjustment part	• IF VR
Specification	• Minimum noise

Note: *Adjust IF VR (RF AGC) to correct for excess noise in the picture or when streaks cross interference occurs due to strong electrical fields.*

(1) Adjust IF VR to minimize noise or streaks on the TV screen.
(2) Adjust for noisy picture with strong signal. Then adjust until noise just disappears. Select other channels to confirm proper pick-up of channels.

SECTION 4
CHARTS AND DIAGRAMS

SCHEMATIC DIAGRAM NOTES

Safety precautions

The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufactures recommended parts.

1. Schematic diagram values

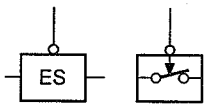
Unless otherwise specified.

1) All resistance values are in ohms. 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values in μH, (m: mH).
4) All diodes are 1SS133 or MA165, (refer to parts list).

2. Indications

AUX : Active only at high.

$\overline{AUX}$: Active only at low.

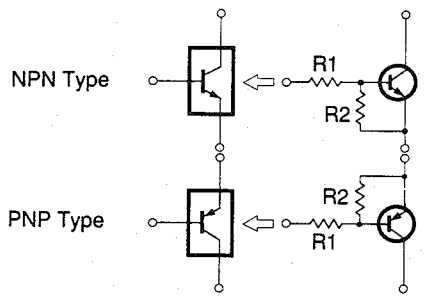


Active only at low for electronic switch.

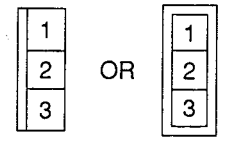
Active only at high for electronic switch.

Digital transistor :

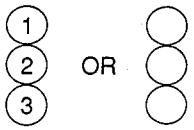
The digital transistor includes built in resistors.
It features small size and high reliability.



3. Interpreting Connector indications

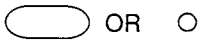


Removable connector



Direct connection on board

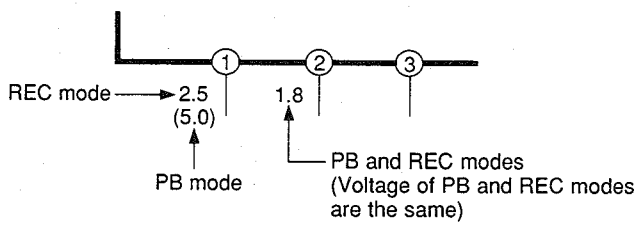
Non-removable Board connector



Connected pattern on board

4. Voltage measurement

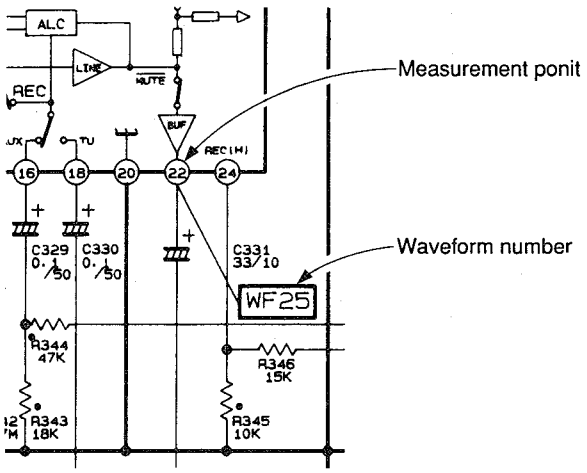
1) Video circuits
   REC: Colour bar signal in SP mode, normal VHS mode.
   PB : Alignment tape, colour bar SP mode, normal VHS mode.
   — : Unmeasurable or unnecessary to measure.
2) Audio circuits
   REC: 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode.
   PB : REC then playback it.
3) Movie Camera circuits
   Measured using a correctly illuminated grey scale or colour bar test charts in the E-E mode.
4) Indication on schematic diagram
   Voltage Indications for REC and PB modes on the schematic diagram are as shown below.



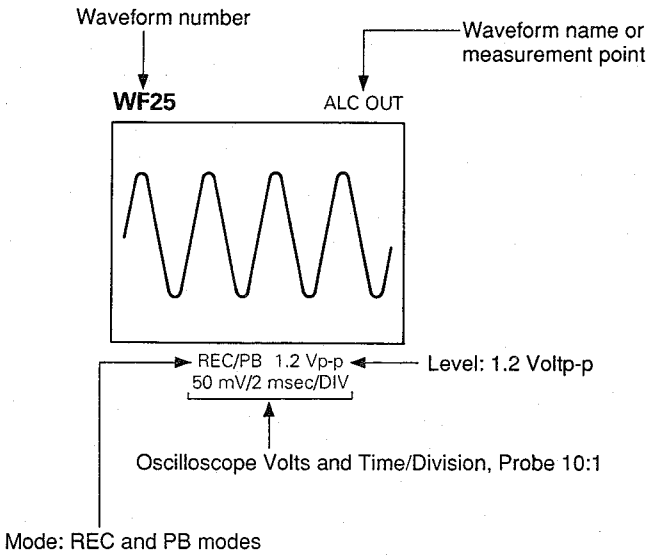
Note: If do not indicate for voltage measurement on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC: Colour bar signal in SP mode, normal VHS mode.
   PB : Alignment tape, colour bar SP mode, normal VHS mode.
2) Audio circuits
   REC: 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode.
   PB : REC then playback it.
3) Movie Camera circuits
   Measured using a correctly illuminated grey scale or colour bar test charts in the E-E mode.
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.



5) Waveform indications



6. Signal path Symbols

The arrows indicate the signal path as follows.

- Playback signal path
- Playback and recording signal path
- Recording signal path (including E-E signal path)
- Y signal path
- Colour (Chroma) signal path
- R or R-Y signal path
- B or B-Y signal path
- Capstan servo path
- Drum servo path
- Reel servo path

CIRCUIT BOARD NOTES

1. Colour indications

1) Foil side :
   Foil side patterns are indicated at GREY shading.
2) Component side :
   Component side patterns are indicated at RED shading.

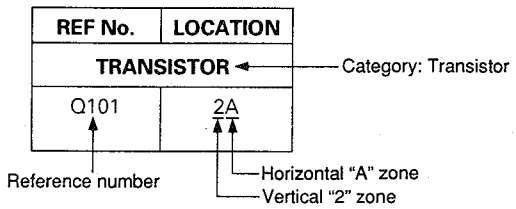
2. Foil and Component sides

1) Foil side (B side) :
   Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
   Parts on the component side seen from component face (parts face) are indicated.

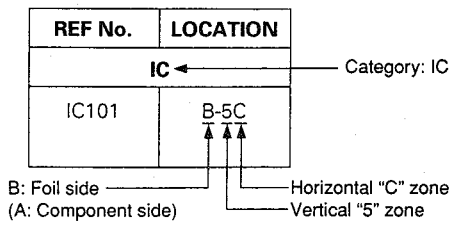
3. Parts location guides

Parts location are indicated by guide scale on the circuit board.

1) Signal pattern :



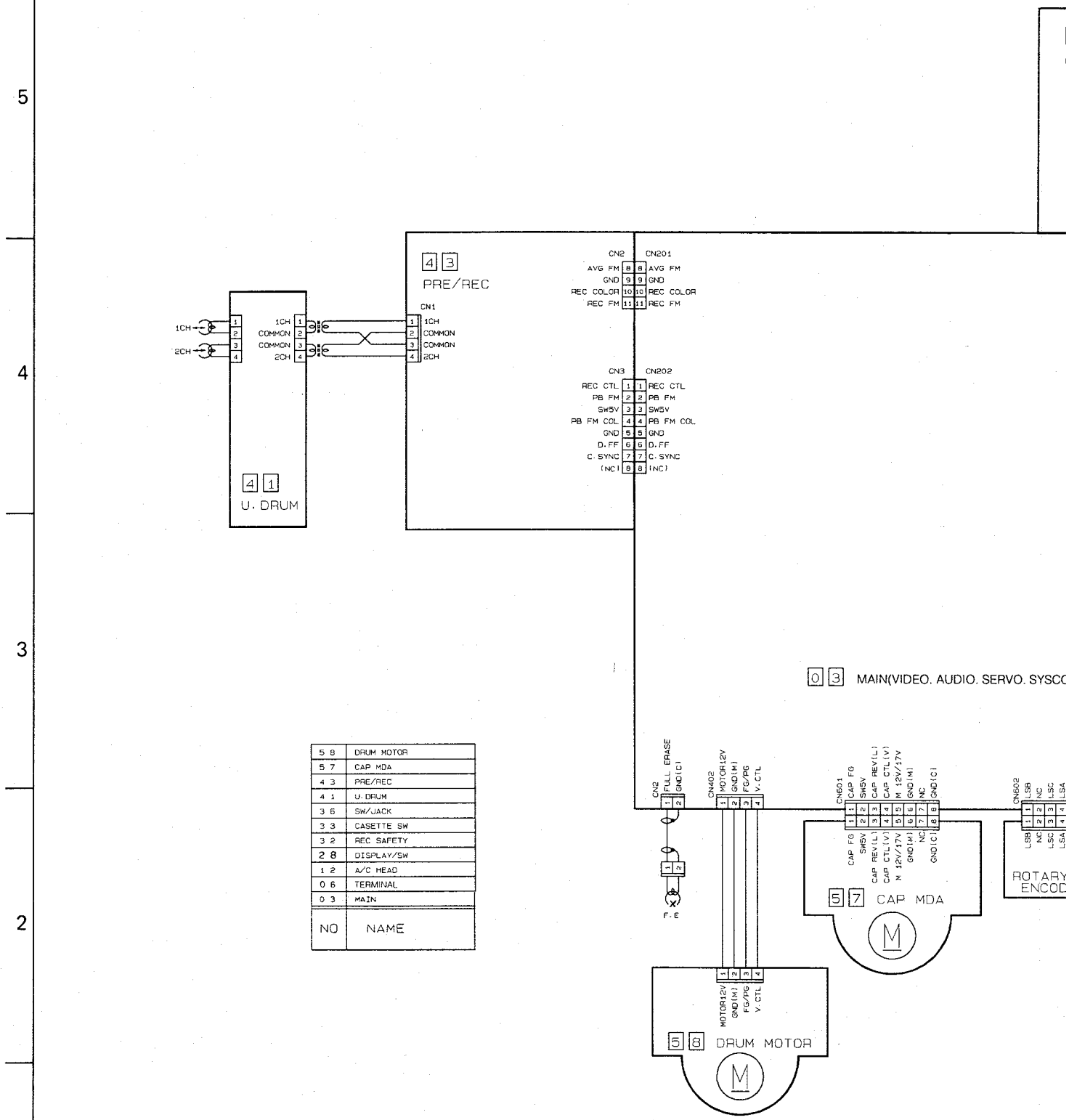
2) Double pattern :



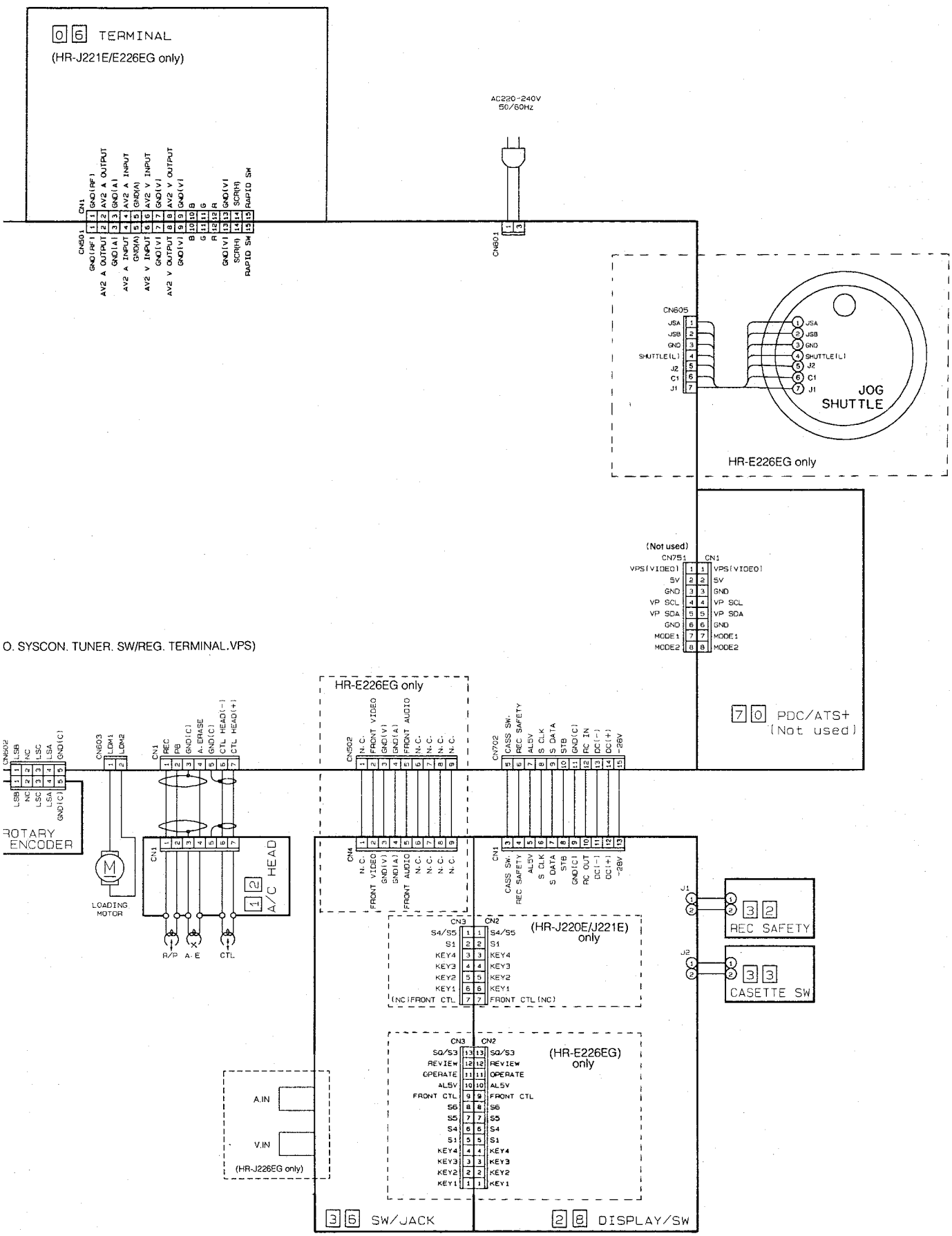
Notes:

1) **For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).**
2) **For repairing SMC (Surface Mounted Components), please refer to the VIDEO SERVICE GUIDE No. VTS81001.**

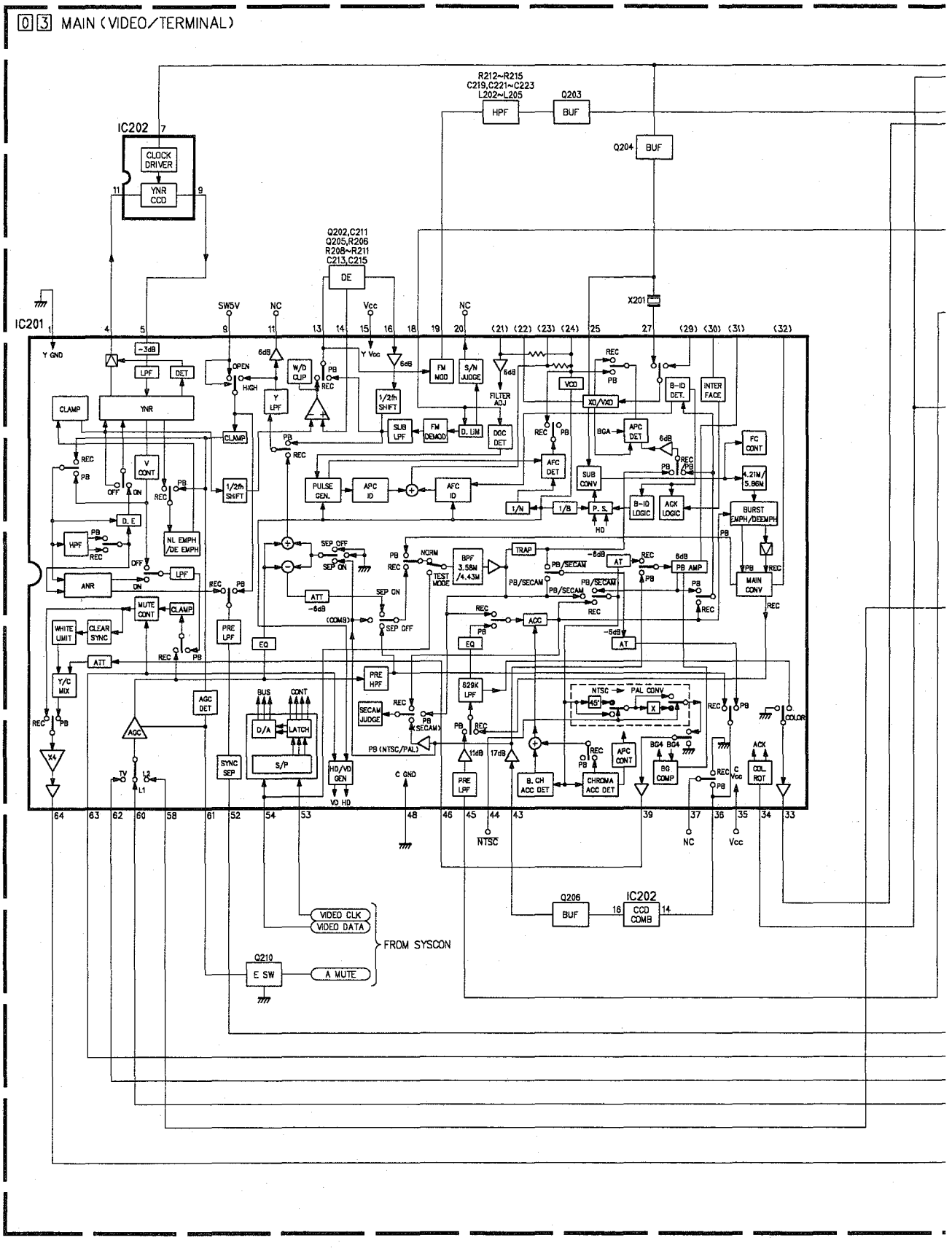
4.1 BOARD INTERCONNECTIONS

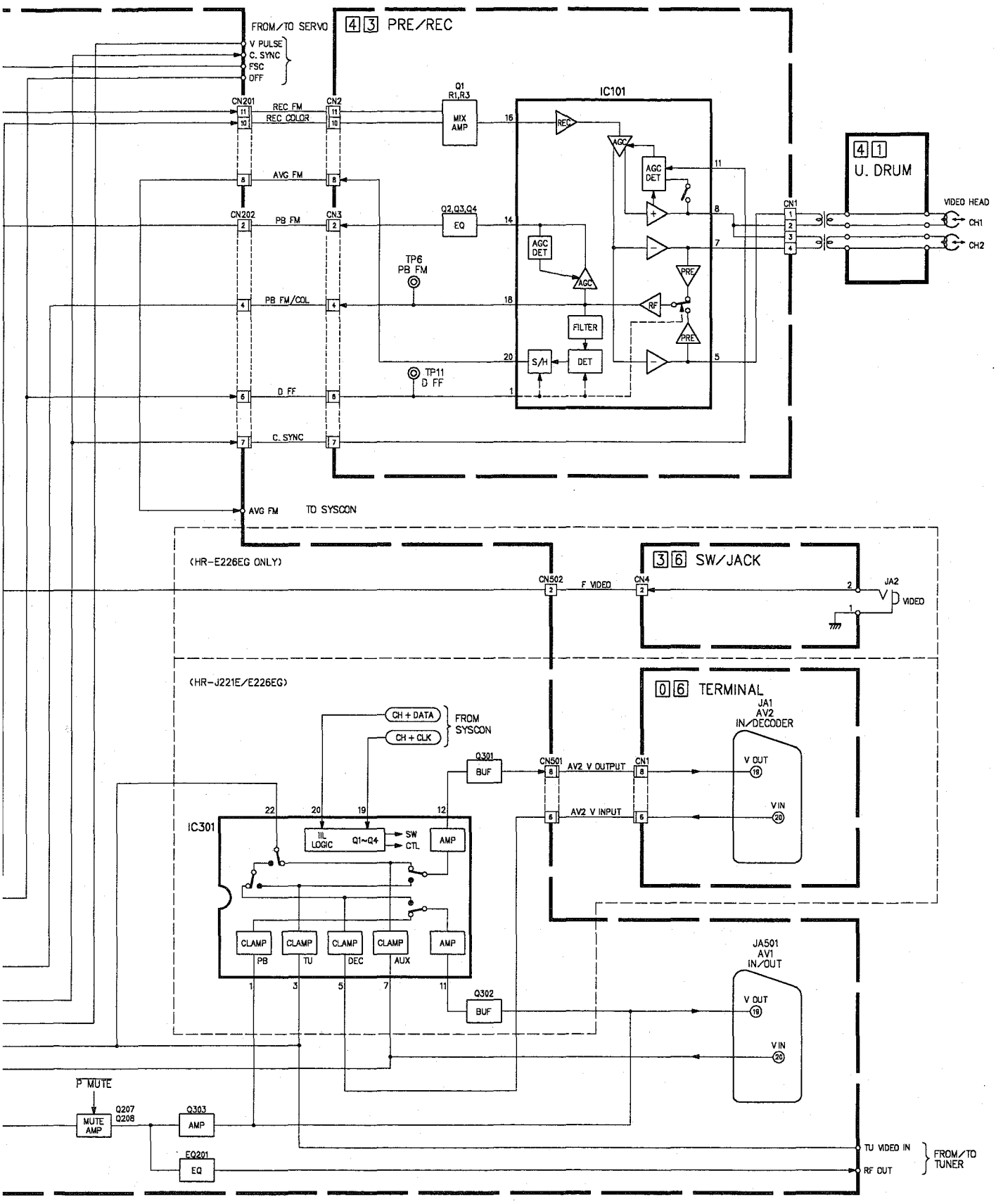


NO	NAME
5 8	DRUM MOTOR
5 7	CAP MDA
4 3	PRE/REC
4 1	U. DRUM
3 6	SW/JACK
3 3	CASETTE SW
3 2	REC SAFETY
2 8	DISPLAY/SW
1 2	A/C HEAD
0 6	TERMINAL
0 3	MAIN

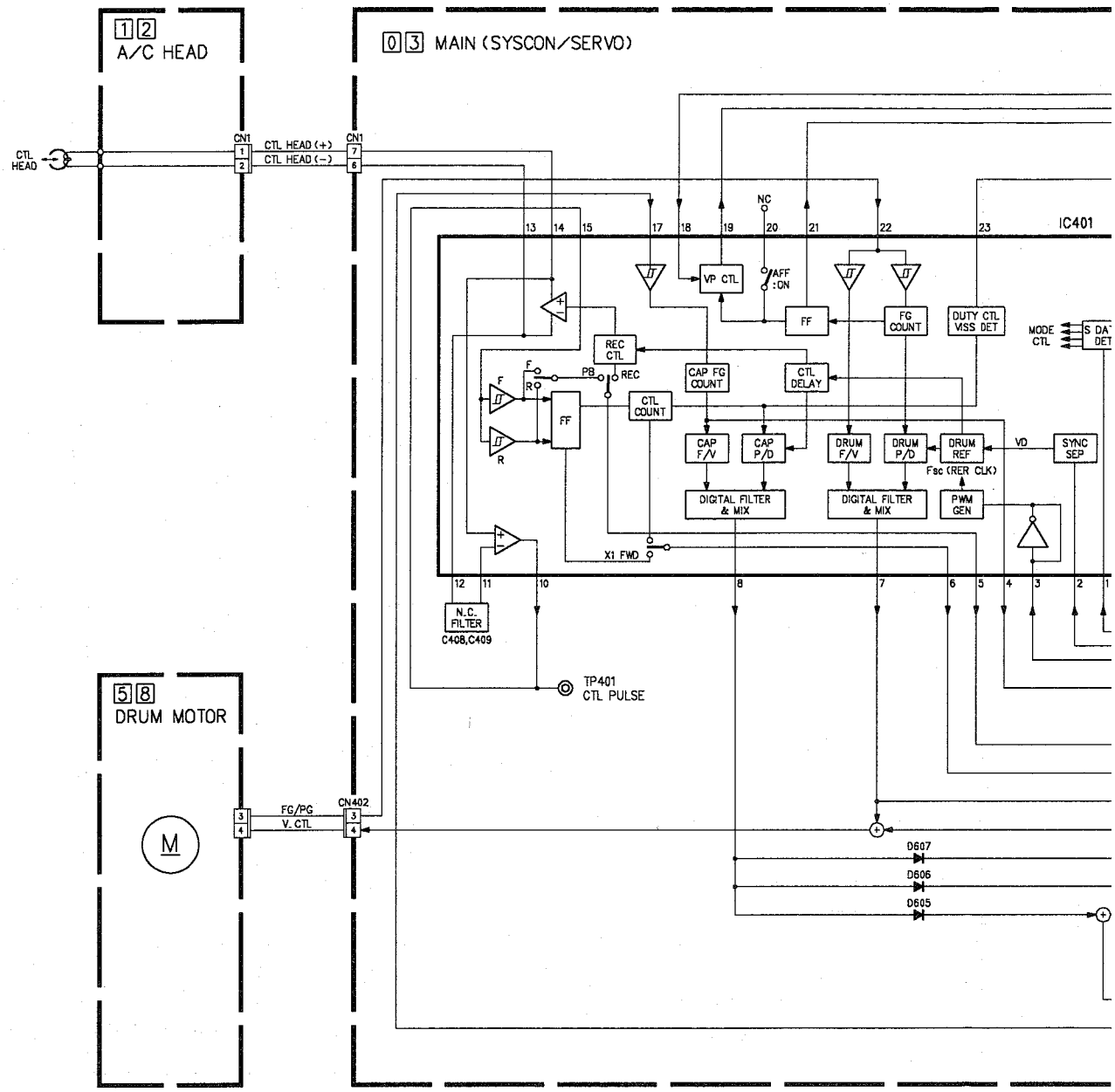

06 TERMINAL
(HR-J221E/E226EG only)
AC220-240V
50/60Hz
CN801
CN605
JOG
SHUTTLE
HR-E226EG only
(Not used)
CN751
CN1
70 PDC/ATS+
(Not used)
O. SYSCON. TUNER. SW/REG. TERMINAL.VPS)
HR-E226EG only
ROTARY
ENCODER
LOADING
MOTOR
A/C HEAD
R/P
A.E
CTL
(HR-J220E/J221E)
only
REC SAFETY
CASETTE SW
(HR-E226EG)
only
A.IN
V.IN
(HR-J226EG only)
36 SW/JACK
28 DISPLAY/SW

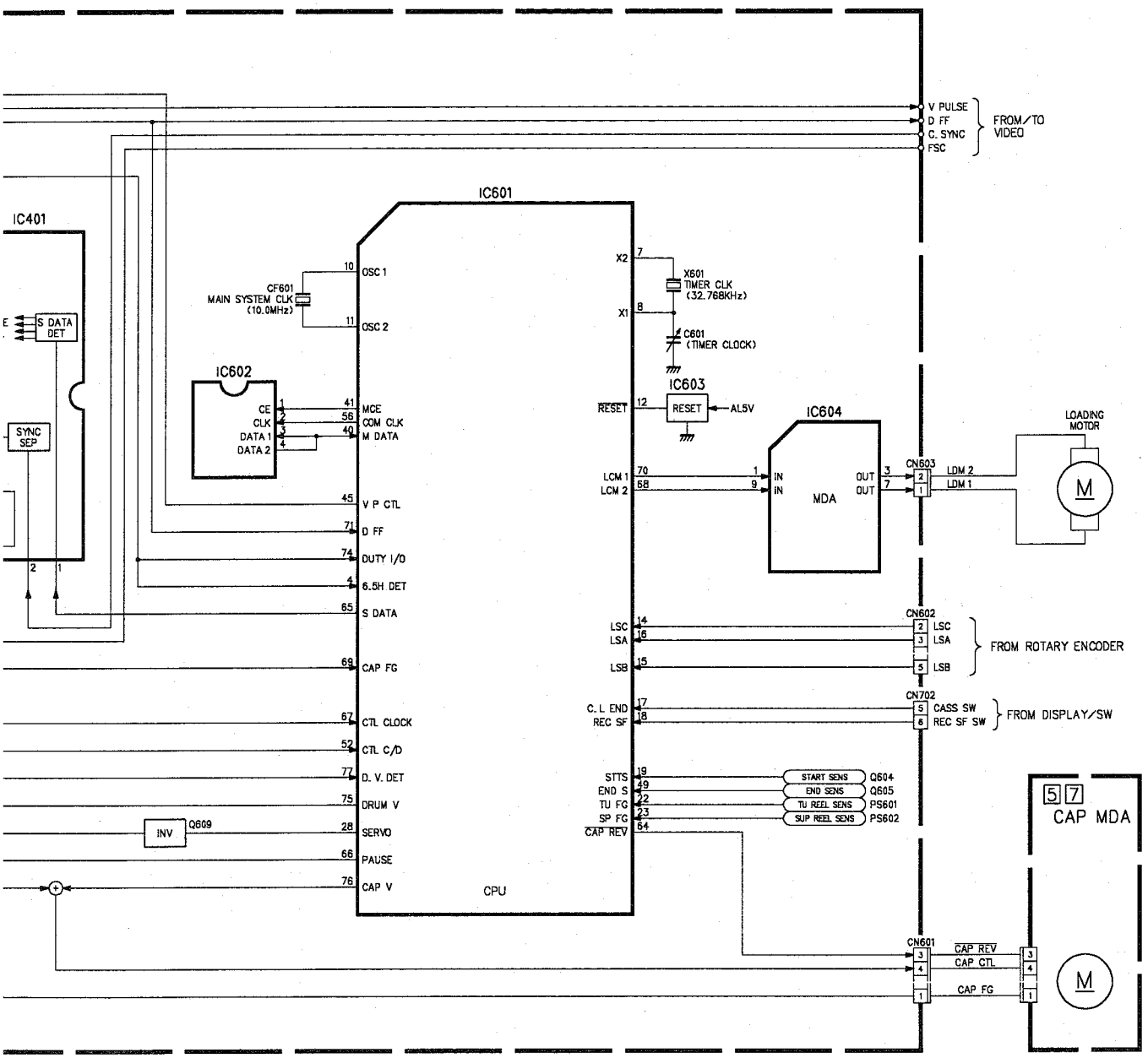
4.2 VIDEO BLOCK DIAGRAM



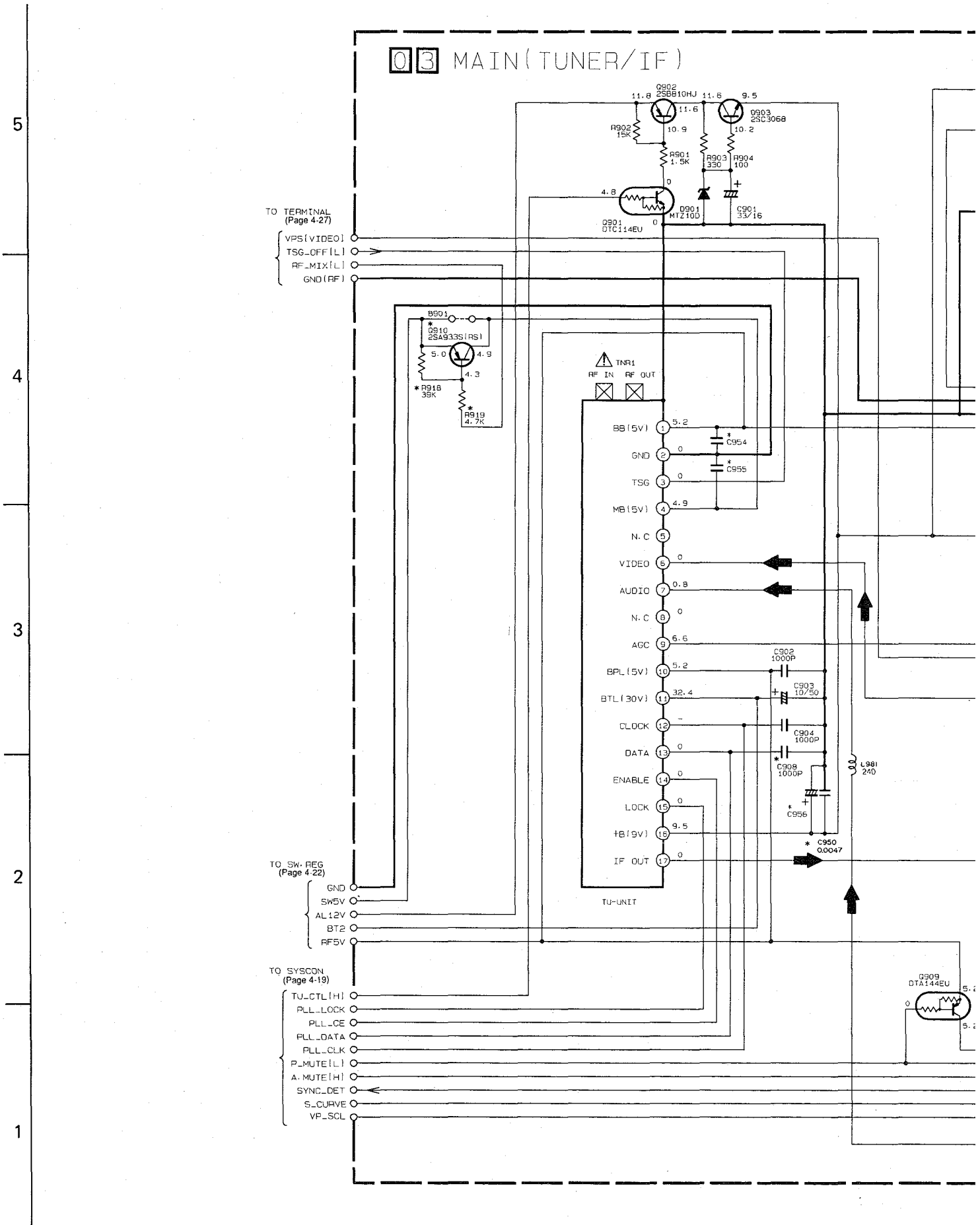

FROM/TO SERVO
V PULSE
C. SYNC
FSC
OFF
4 3 PRE/REC
CN201
CN2
REC FM
REC COLOR
AVG FM
CN202
CN3
PB FM
PB FM/COL
D FF
C. SYNC
Q1
R1,R3
MIX AMP
Q2,Q3,Q4
EQ
IC101
REC
AGC
AGC DET
PRE
RF
FILTER
S/H
DET
TP6
PB FM
TP11
D FF
4 1
U. DRUM
CN1
VIDEO HEAD
CH1
CH2
AVG FM
TO SYSCON
(HR-E226EG ONLY)
3 6 SW/JACK
CN502
F VIDEO
CN4
JA2
VIDEO
(HR-J221E/E226EG)
0 6 TERMINAL
JA1
AV2
IN/DECODER
V OUT
VIN
CH + DATA
CH + CLK
FROM SYSCON
Q301
BUF
CN501
AV2 V OUTPUT
AV2 V INPUT
IC301
IIL LOGIC
Q1~Q4
SW CTL
AMP
CLAMP
PB
TU
DEC
AUX
Q302
JA501
AV1
IN/OUT
P MUTE
MUTE AMP
Q207
Q208
Q303
EQ201
EQ
TU VIDEO IN
RF OUT
FROM/TO TUNER

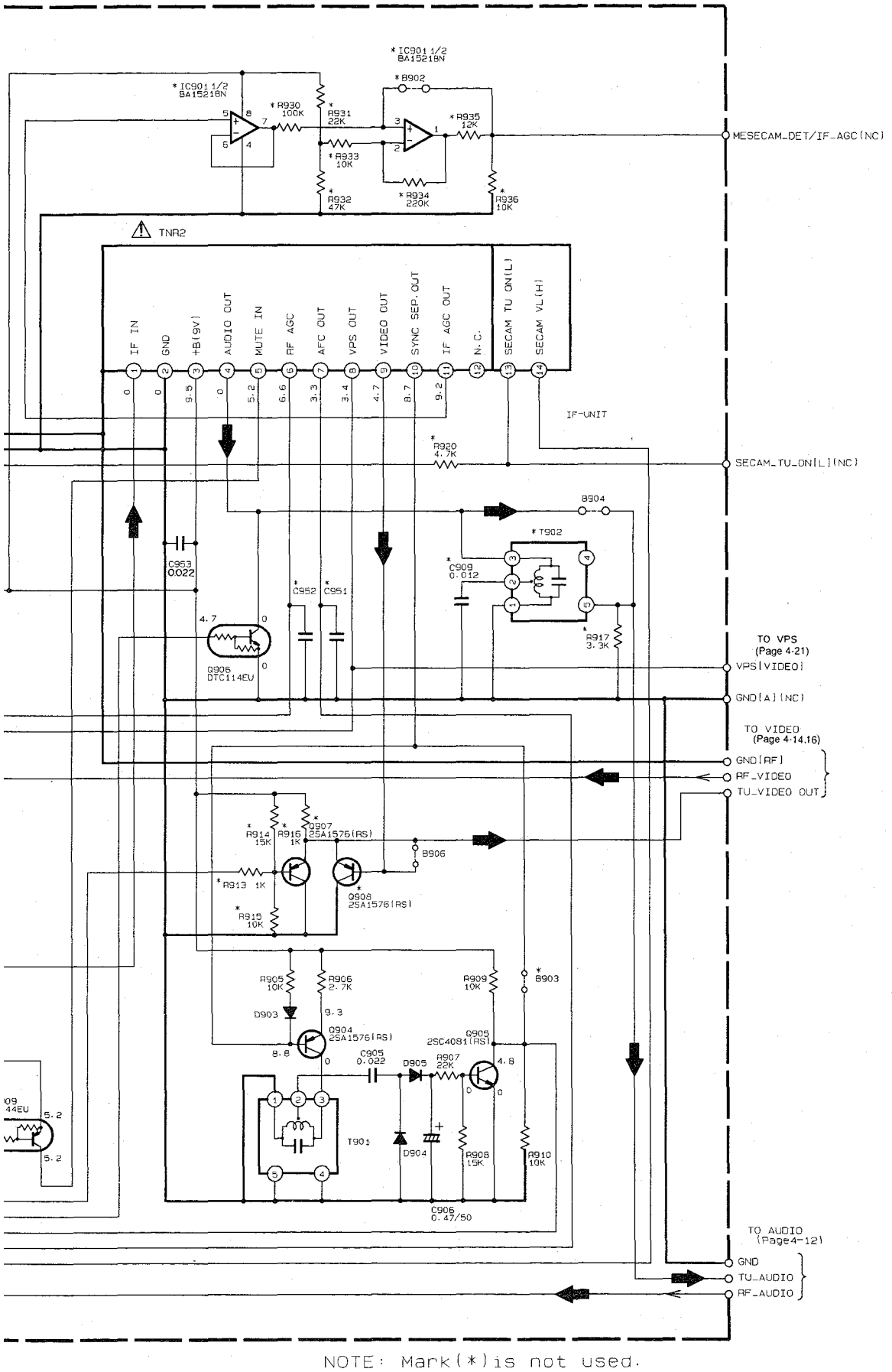
4.3 SYSCON/SERVO BLOCK DIAGRAM




V PULSE
D FF
C. SYNC
FSC
FROM/TO VIDEO
IC601
IC401
S DATA DET
SYNC SEP
CF601
MAIN SYSTEM CLK (10.0MHz)
OSC 1
OSC 2
IC602
CE
CLK
DATA 1
DATA 2
MCE
COM CLK
M DATA
V P CTL
D FF
DUTY I/O
6.5H DET
S DATA
CAP FG
CTL CLOCK
CTL C/D
D. V. DET
DRUM V
SERVO
PAUSE
CAP V
INV
Q609
CPU
X2
X1
X601
TIMER CLK (32.768KHz)
C601
(TIMER CLOCK)
IC603
RESET
AL5V
IC604
MDA
LCM 1
LCM 2
IN
OUT
CN603
LDM 2
LDM 1
LOADING MOTOR
M
CN602
LSC
LSA
LSB
FROM ROTARY ENCODER
CN702
C. L END
REC SF
CASS SW
REC SF SW
FROM DISPLAY/SW
STTS
END S
TU FG
SP FG
CAP REV
START SENS
END SENS
TU REEL SENS
SUP REEL SENS
Q604
Q605
PS601
PS602
5 7
CAP MDA
CN601
CAP REV
CAP CTL
CAP FG

4.4 TUNER SCHEMATIC DIAGRAM



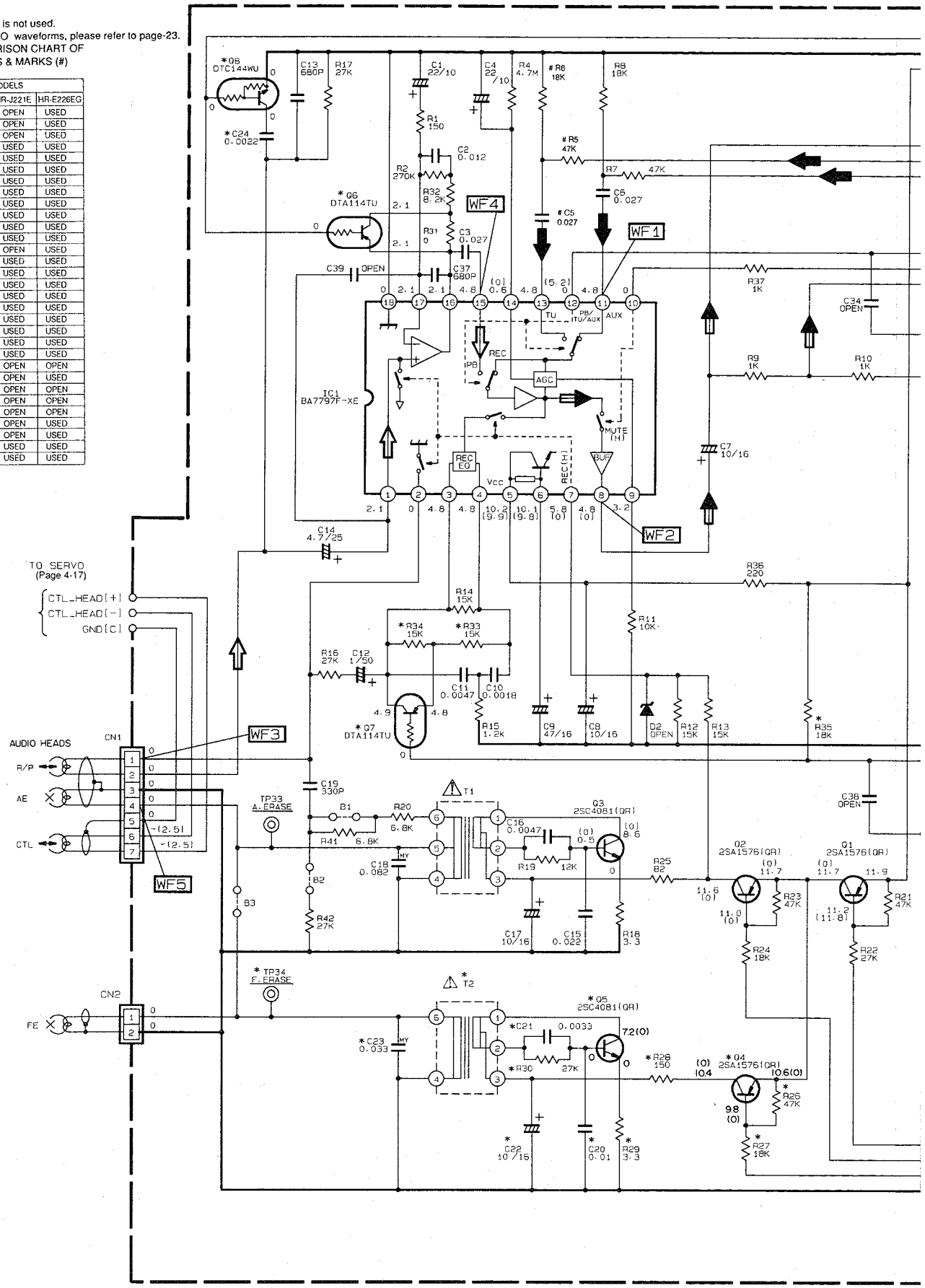


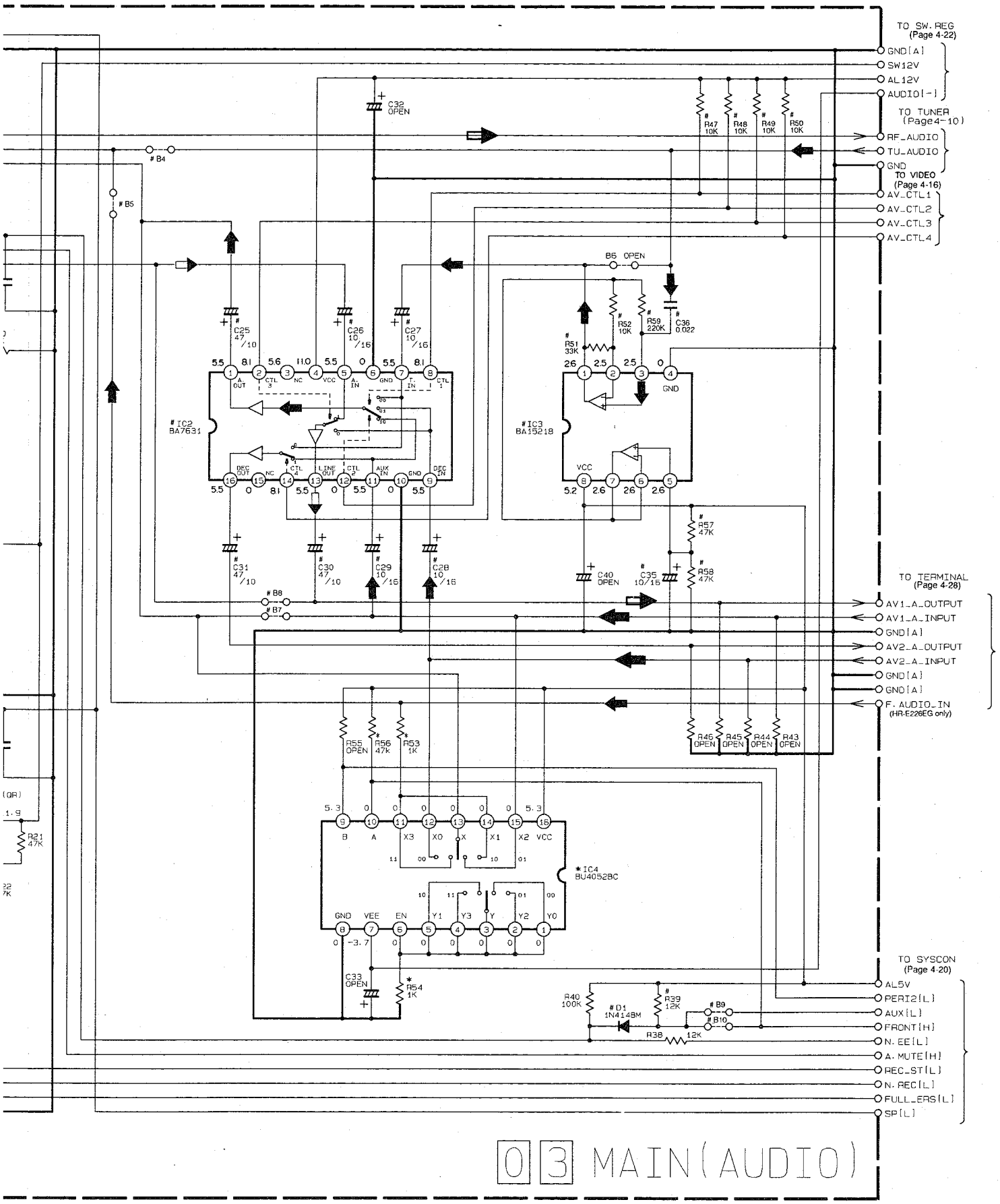
NOTE: Mark(*)is not used.

4.5 AUDIO SCHEMATIC DIAGRAM

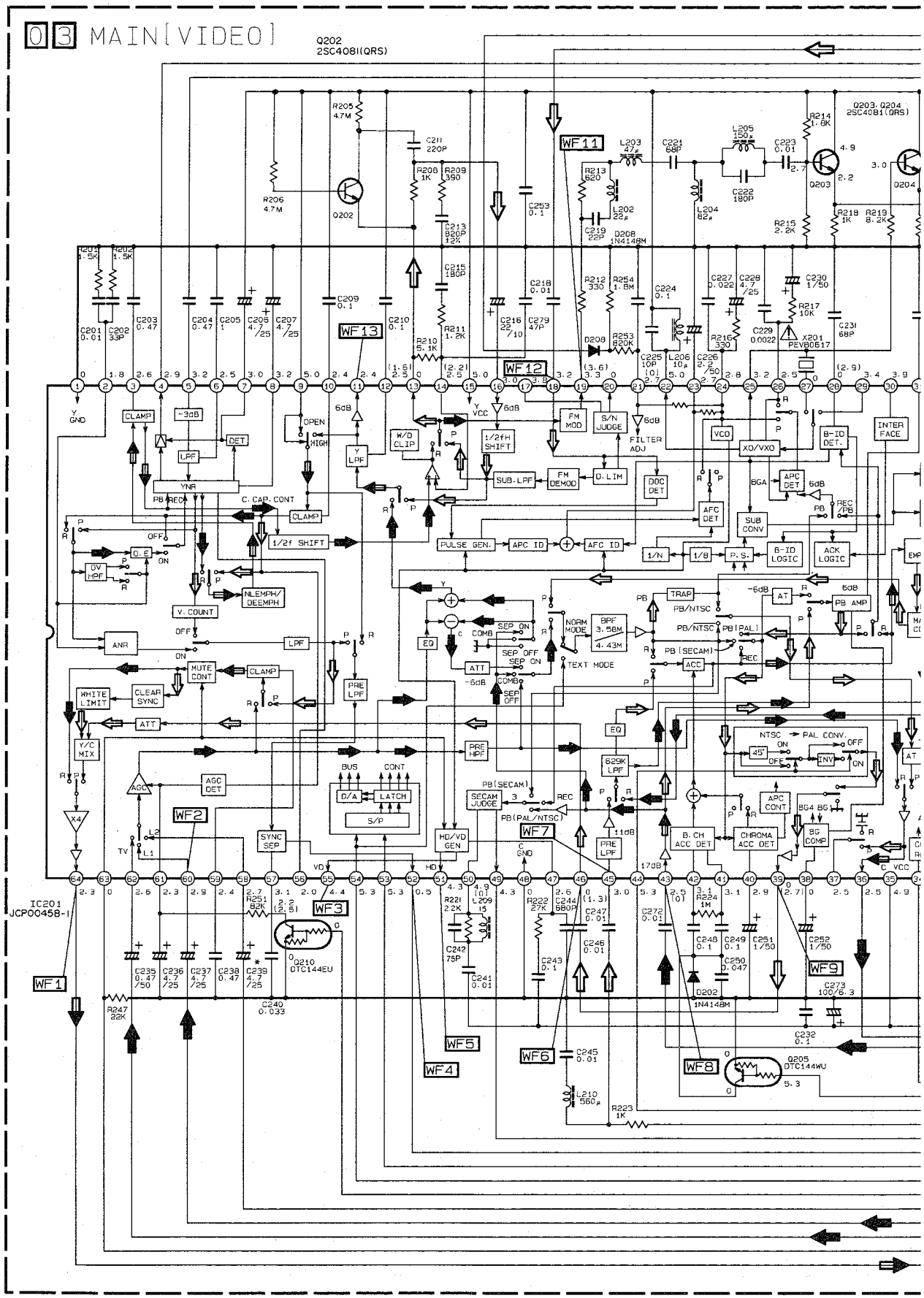
NOTES: 1 Mark (*) is not used.
: 2 For AUDIO waveforms, please refer to page-23.
: 3 COMPARISON CHART OF MODELS & MARKS (#)

REF. NO	MODELS		
	HR-J220E	HR-J221E	HR-E226EG
R5	SHORT	OPEN	USED
R6	OPEN	OPEN	USED
R39	USED	OPEN	USED
R47	OPEN	USED	USED
R48	OPEN	USED	USED
R49	OPEN	USED	USED
R50	OPEN	USED	USED
R51	OPEN	USED	USED
R52	OPEN	USED	USED
R57	OPEN	USED	USED
R58	OPEN	USED	USED
R59	OPEN	USED	USED
C5	USED	OPEN	USED
C25	OPEN	USED	USED
C26	OPEN	USED	USED
C27	OPEN	USED	USED
C28	OPEN	USED	USED
C29	OPEN	USED	USED
C30	OPEN	USED	USED
C31	OPEN	USED	USED
C35	OPEN	USED	USED
C36	OPEN	USED	USED
B4	USED	OPEN	OPEN
B5	OPEN	OPEN	USED
B7	USED	OPEN	OPEN
B8	USED	OPEN	OPEN
B9	USED	OPEN	OPEN
B10	OPEN	OPEN	USED
D1	USED	OPEN	USED
IC2	OPEN	USED	USED
IC3	OPEN	USED	USED

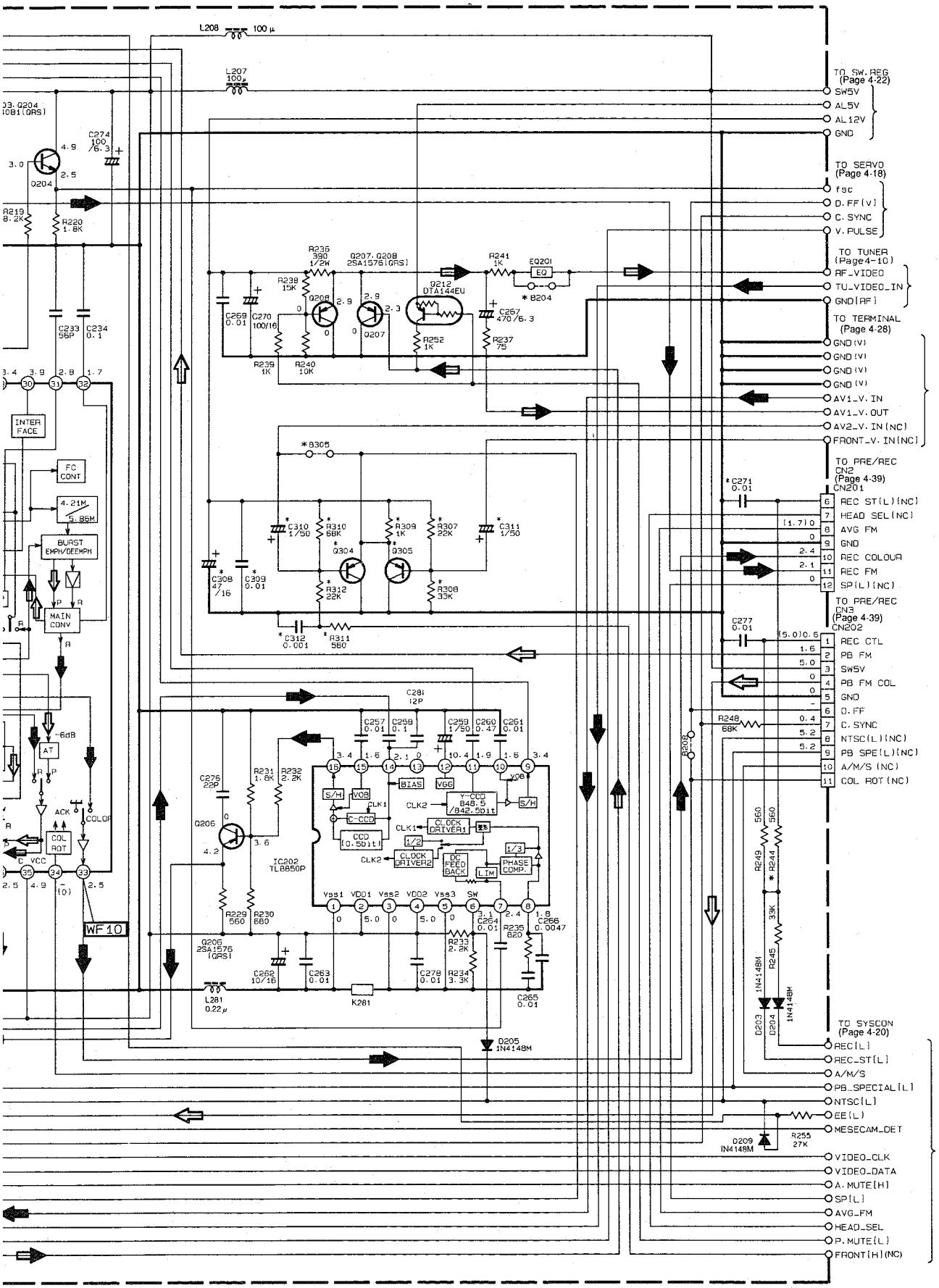



TO SW. REG (Page 4-22)
GND[A]
SW12V
AL12V
AUDIO[-]
TO TUNER (Page4-10)
RF_AUDIO
TU_AUDIO
GND
TO VIDEO (Page 4-16)
AV_CTL1
AV_CTL2
AV_CTL3
AV_CTL4
TO TERMINAL (Page 4-28)
AV1_A_OUTPUT
AV1_A_INPUT
GND[A]
AV2_A_OUTPUT
AV2_A_INPUT
GND[A]
GND[A]
F. AUDIO_IN (HR-E226EG only)
TO SYSCON (Page 4-20)
AL5V
PERI2[L]
AUX[L]
FRONT[H]
N. EE[L]
A. MUTE[H]
REC_ST[L]
N. REC[L]
FULL_ERS[L]
SP[L]
C32 OPEN
R47 10K
R48 10K
R49 10K
R50 10K
B4
B5
B6 OPEN
C25 47/10
C26 10/16
C27 10/16
R52 10K
R59 220K
C36 0.022
R51 33K
IC2 BA7631
IC3 BA15218
GND
VCC
C31 47/10
C30 47/10
C29 10/16
C28 10/16
C40 OPEN
C35 10/16
R57 47K
R58 47K
B8
B7
R55 OPEN
R56 47k
R53 1K
R46 OPEN
R45 OPEN
R44 OPEN
R43 OPEN
R21 47K
* IC4 BU4052BC
C33 OPEN
R54 1K
R40 100K
D1 1N4148M
R39 12K
B9
B10
R38 12K
03 MAIN(AUDIO)

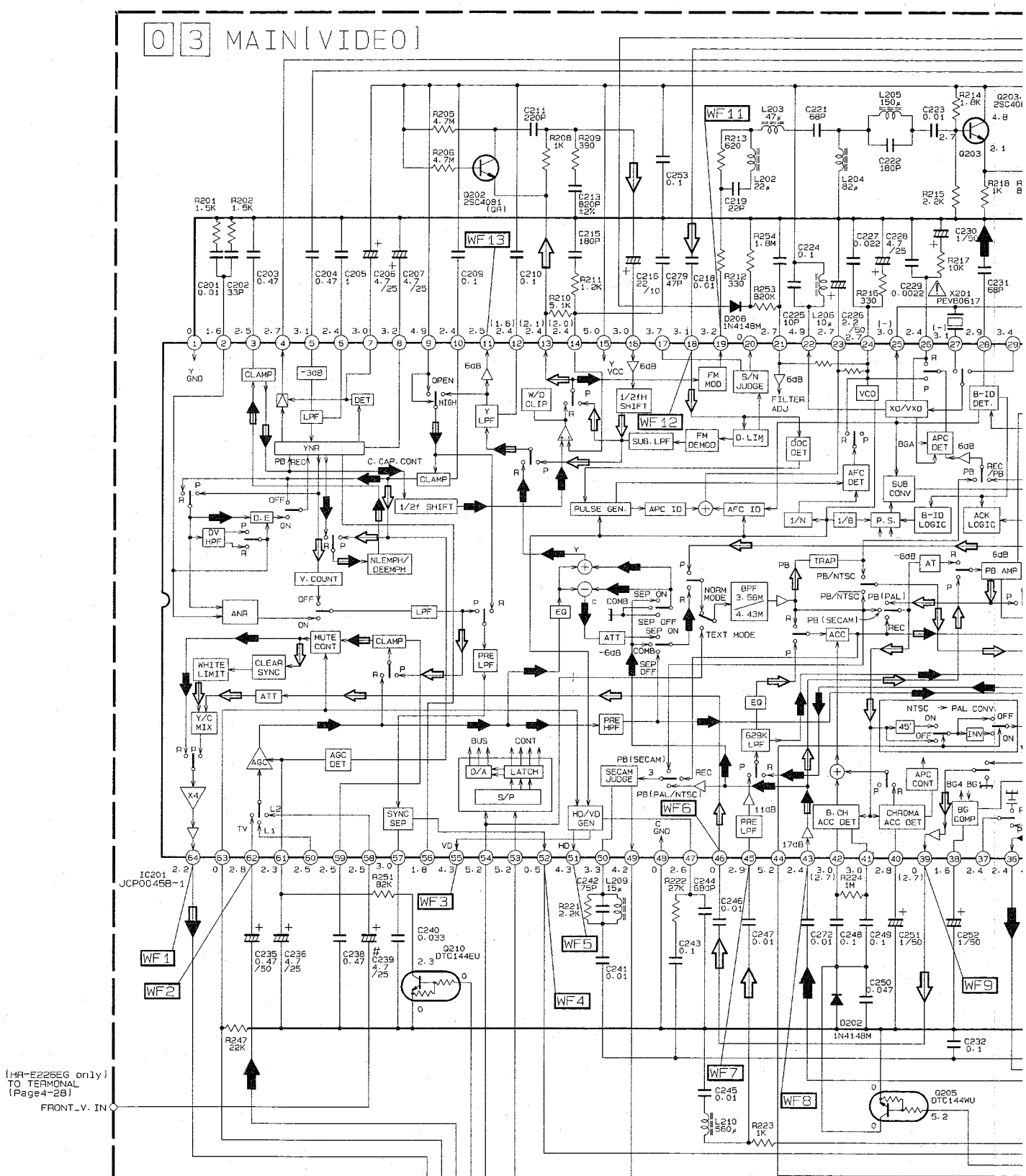
4.6 VIDEO SCHEMATIC DIAGRAM (for HR-J220E)



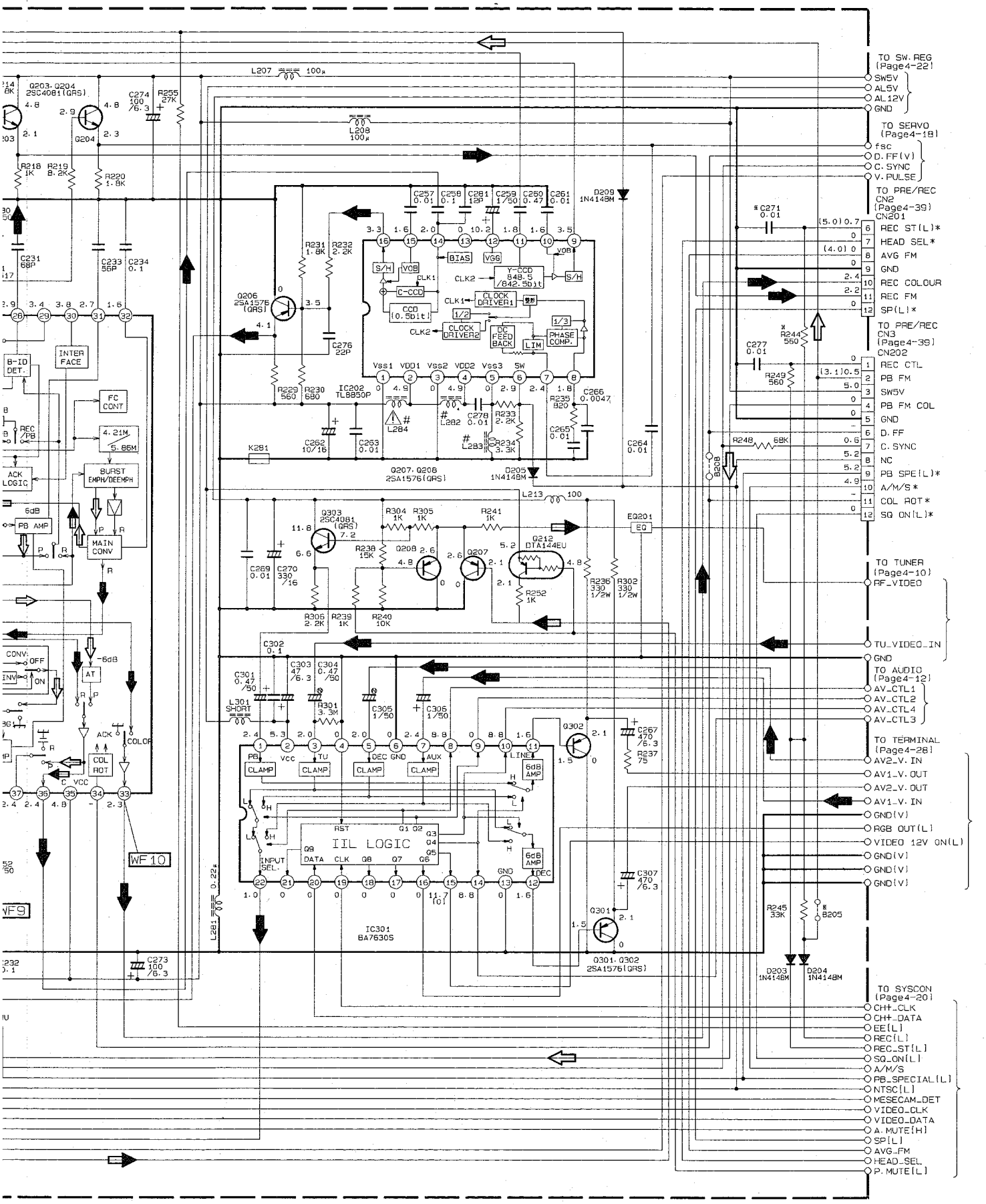
NOTES : 1 For VIDEO waveforms please refer to page 4-23.
: 2 Mark(*) is not used.


L208 100 µ
L207 100µ
TO SW. REG (Page 4-22)
SW5V
AL5V
AL12V
GND
TO SERVO (Page 4-18)
fsc
D. FF(V)
C. SYNC
V. PULSE
TO TUNER (Page4-10)
RF_VIDEO
TU_VIDEO_IN
GND(RF)
TO TERMINAL (Page 4-28)
GND(V)
GND(V)
GND(V)
GND(V)
AV1_V. IN
AV1_V. OUT
AV2_V. IN(NC)
FRONT_V. IN(NC)
TO PRE/REC CN2 (Page 4-39)
CN201
REC ST(L)(NC)
HEAD SEL(NC)
AVG FM
GND
REC COLOUR
REC FM
SP(L)(NC)
TO PRE/REC CN3 (Page 4-39)
CN202
REC CTL
PB FM
SW5V
PB FM COL
GND
D. FF
C. SYNC
NTSC(L)(NC)
PB SPE(L)(NC)
A/M/S (NC)
COL ROT (NC)
TO SYSCON (Page 4-20)
REC(L)
REC_ST(L)
A/M/S
PB_SPECIAL(L)
NTSC(L)
EE(L)
MESECAM_DET
VIDEO_CLK
VIDEO_DATA
A. MUTE(H)
SP(L)
AVG_FM
HEAD_SEL
P. MUTE(L)
FRONT(H)(NC)
INTER FACE
FC CONT
4.21M 5.86M
BURST EMPH/DEEMPH
MAIN CONV
AT
ACK
COLOR
COL ROT
VCC
WF10
IC202 TL8850P
Q204
Q205
Q206
Q207, Q208 2SA1576(QRS)
Q212 DTA144EU
Q304
Q305
EQ201
EQ
* B204
* B305
D205 1N4148M
D209 1N4148M
D203 1N4148M
D204 1N4148M
K281

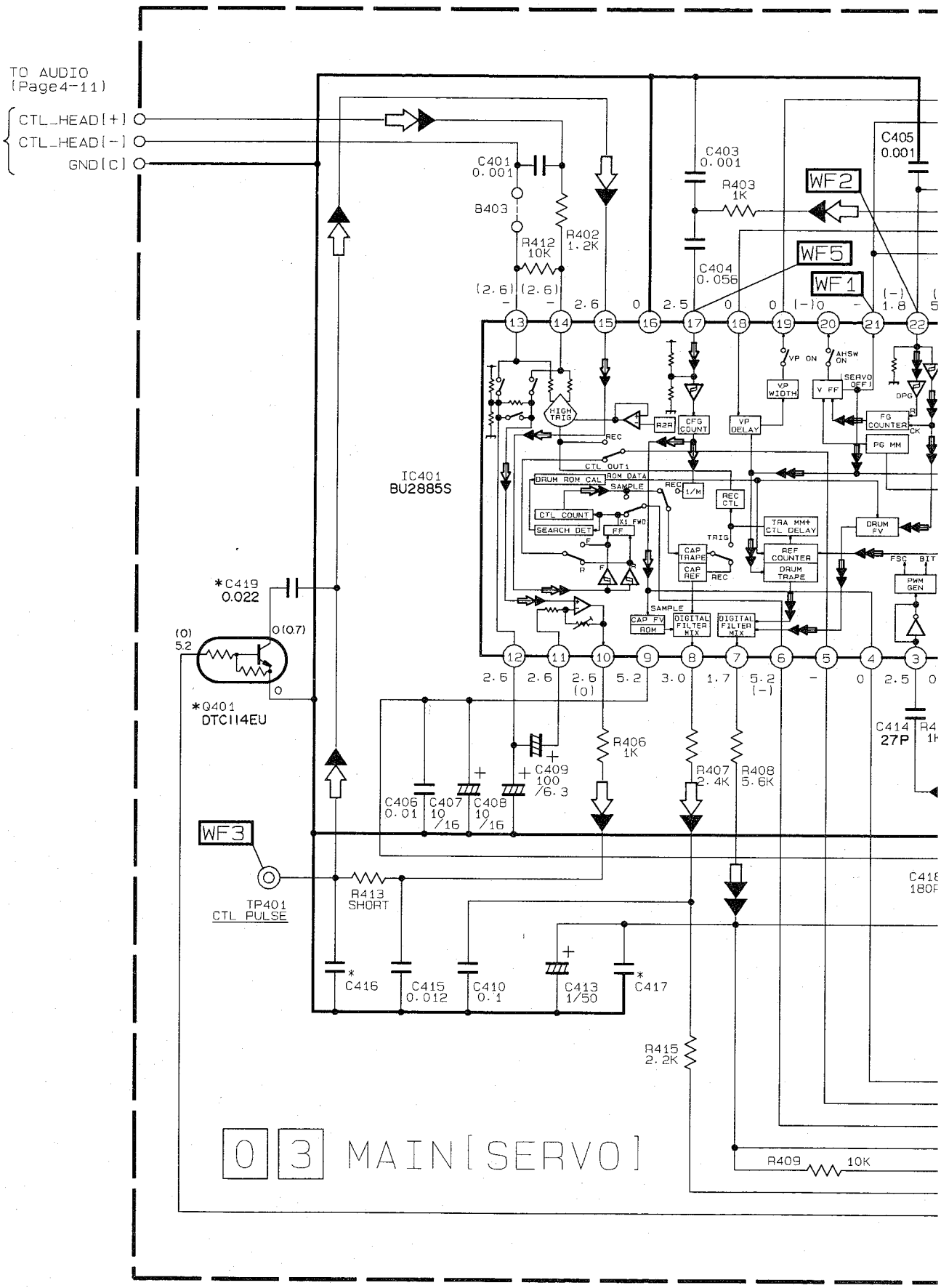
4.7 VIDEO SCHEMATIC DIAGRAM (for HR-J221E/E226EG)



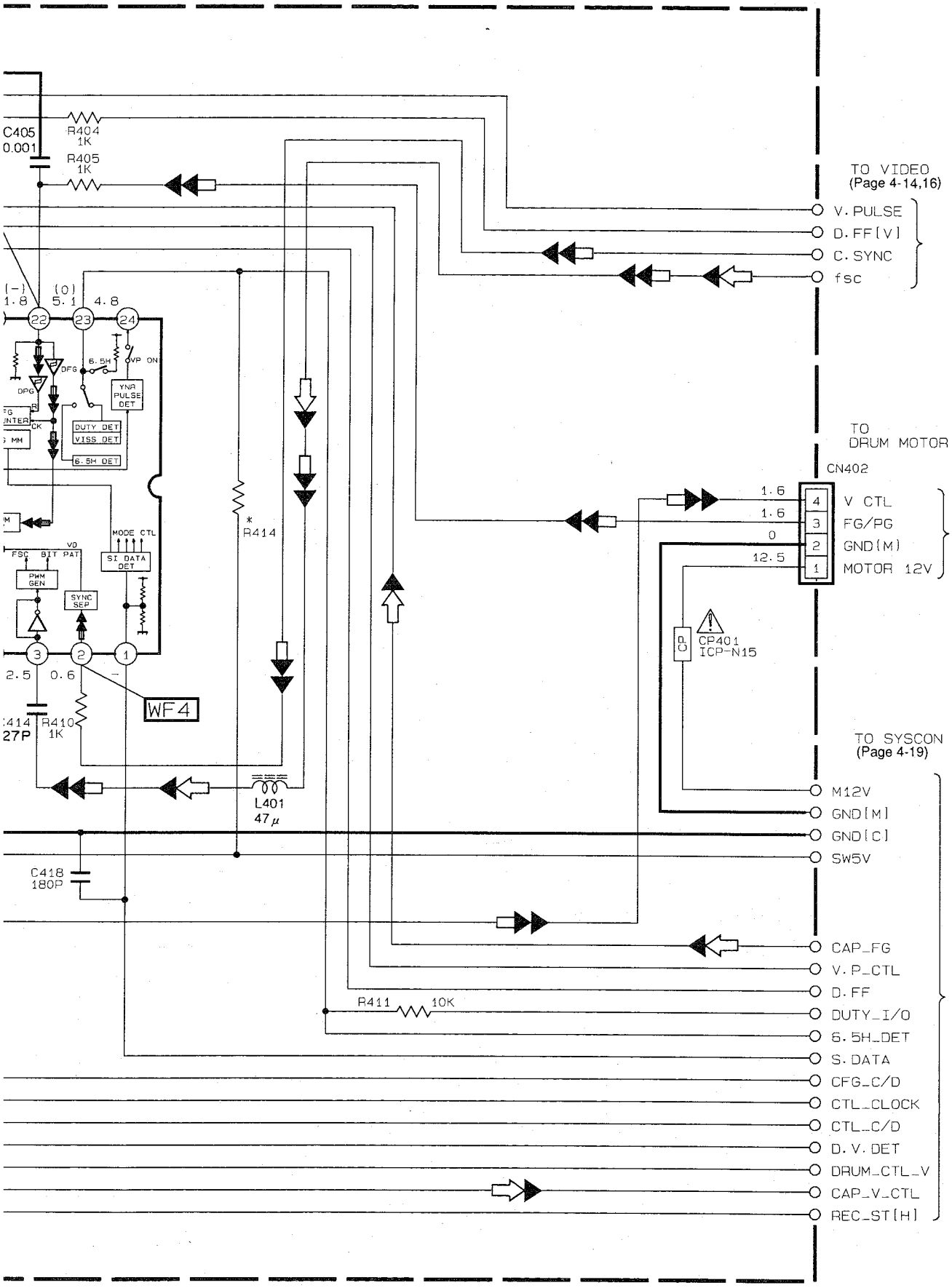
REF. NO	MODELS	
	HR-J221E	HR-J226EG
C239	OPEN	USED
L282	1μ	0.22μ
L283	1μ	0.22μ
L284	10μ	OPEN


TO SW. REG (Page4-22)
SW5V
AL5V
AL12V
GND
TO SERVO (Page4-18)
fsc
D. FF(V)
C. SYNC
V. PULSE
TO PRE/REC CN2 (Page4-39) CN201
REC ST(L)*
HEAD SEL*
AVG FM
GND
REC COLOUR
REC FM
SP(L)*
TO PRE/REC CN3 (Page4-39) CN202
REC CTL
PB FM
SW5V
PB FM COL
GND
D. FF
C. SYNC
NC
PB SPE(L)*
A/M/S*
COL ROT*
SQ ON(L)*
TO TUNER (Page4-10)
RF_VIDEO
TU_VIDEO_IN
GND
TO AUDIO (Page4-12)
AV_CTL1
AV_CTL2
AV_CTL4
AV_CTL3
TO TERMINAL (Page4-28)
AV2_V. IN
AV1_V. OUT
AV2_V. OUT
AV1_V. IN
GND(V)
RGB OUT(L)
VIDEO 12V ON(L)
GND(V)
GND(V)
GND(V)
TO SYSCON (Page4-20)
CHT_CLK
CHT_DATA
EE(L)
REC(L)
REC_ST(L)
SQ_ON(L)
A/M/S
PB_SPECIAL(L)
NTSC(L)
MESECAM_DET
VIDEO_CLK
VIDEO_DATA
A. MUTE(H)
SP(L)
AVG_FM
HEAD_SEL
P. MUTE(L)
IIL LOGIC
IC301 BA7630S
IC202 TL8850P
Q203. Q204 2SC4081(QRS)
Q206 2SA1576(QRS)
Q207. Q208 2SA1576(QRS)
Q301. Q302 2SA1576(QRS)
Q303 2SC4081 (QRS)
Q212 DTA144EU
D205 1N4148M
D209 1N4148M
D203 1N4148M
D204 1N4148M
CCD (0.5bit)
Y-CCD 848.5 /642.5bit
CLOCK DRIVER1
CLOCK DRIVER2
DC FEED BACK
PHASE COMP.
INTER FACE
B-ID DET.
FC CONT
REC /PB
ACK LOGIC
BURST EMPH/DEEMPH
PB AMP
MAIN CONV
COL ROT
CLAMP
6dB AMP
INPUT SEL.
WF10
S25501

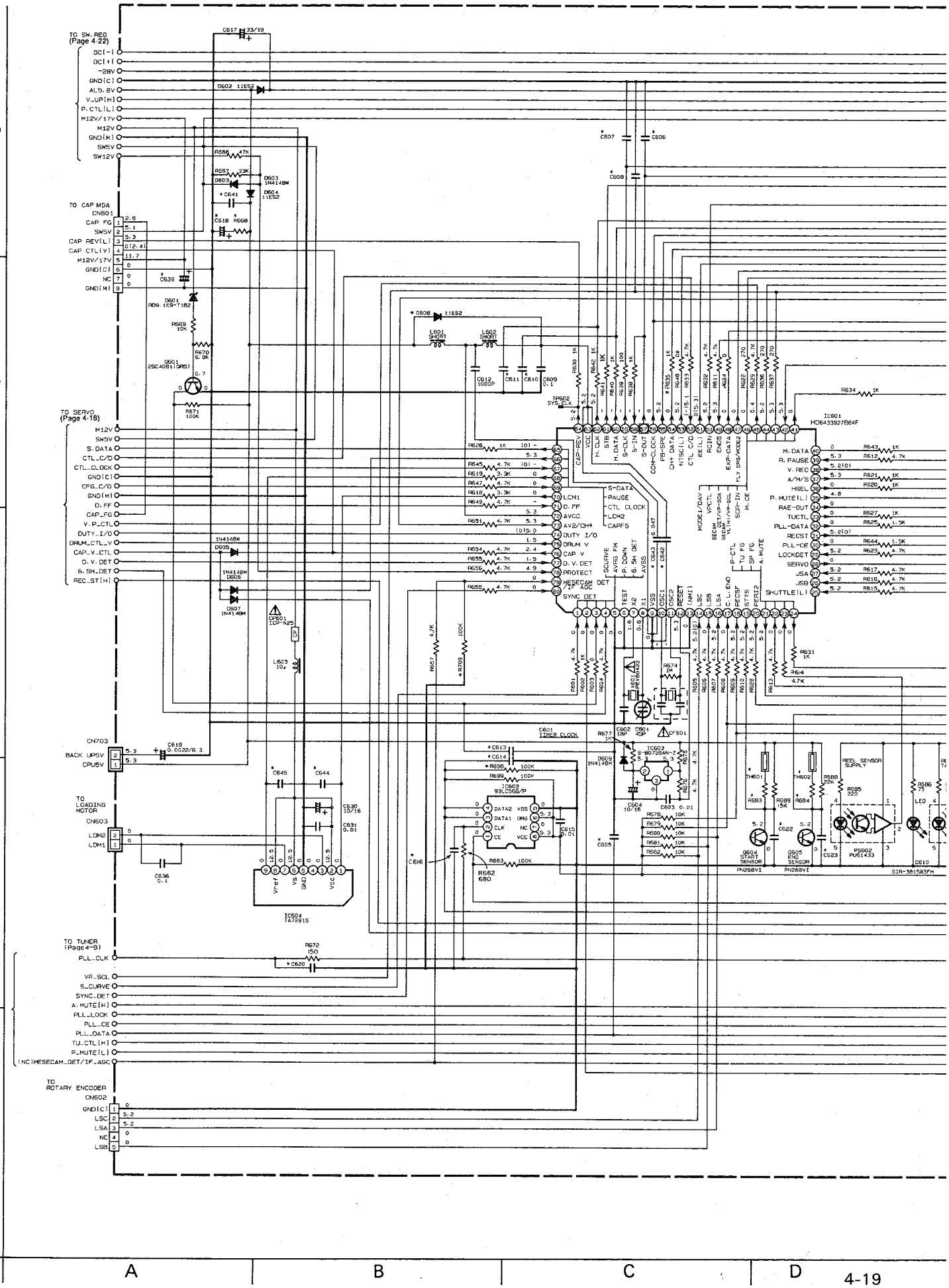
4.8 SERVO SCHEMATIC DIAGRAM

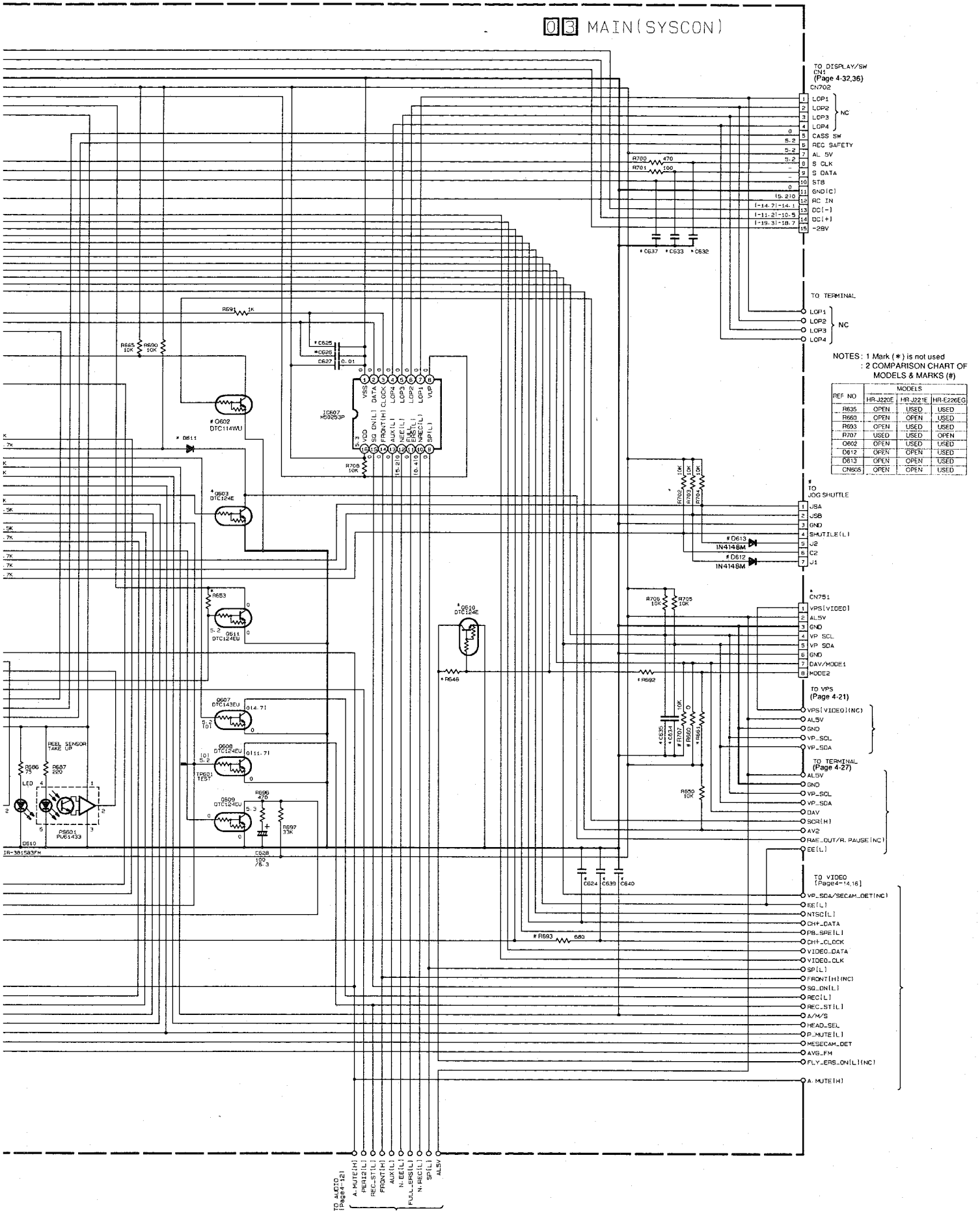


NOTES : 1 For SERVO waveforms please refer to page 4-23.
: 2 Mark (*) is not used.

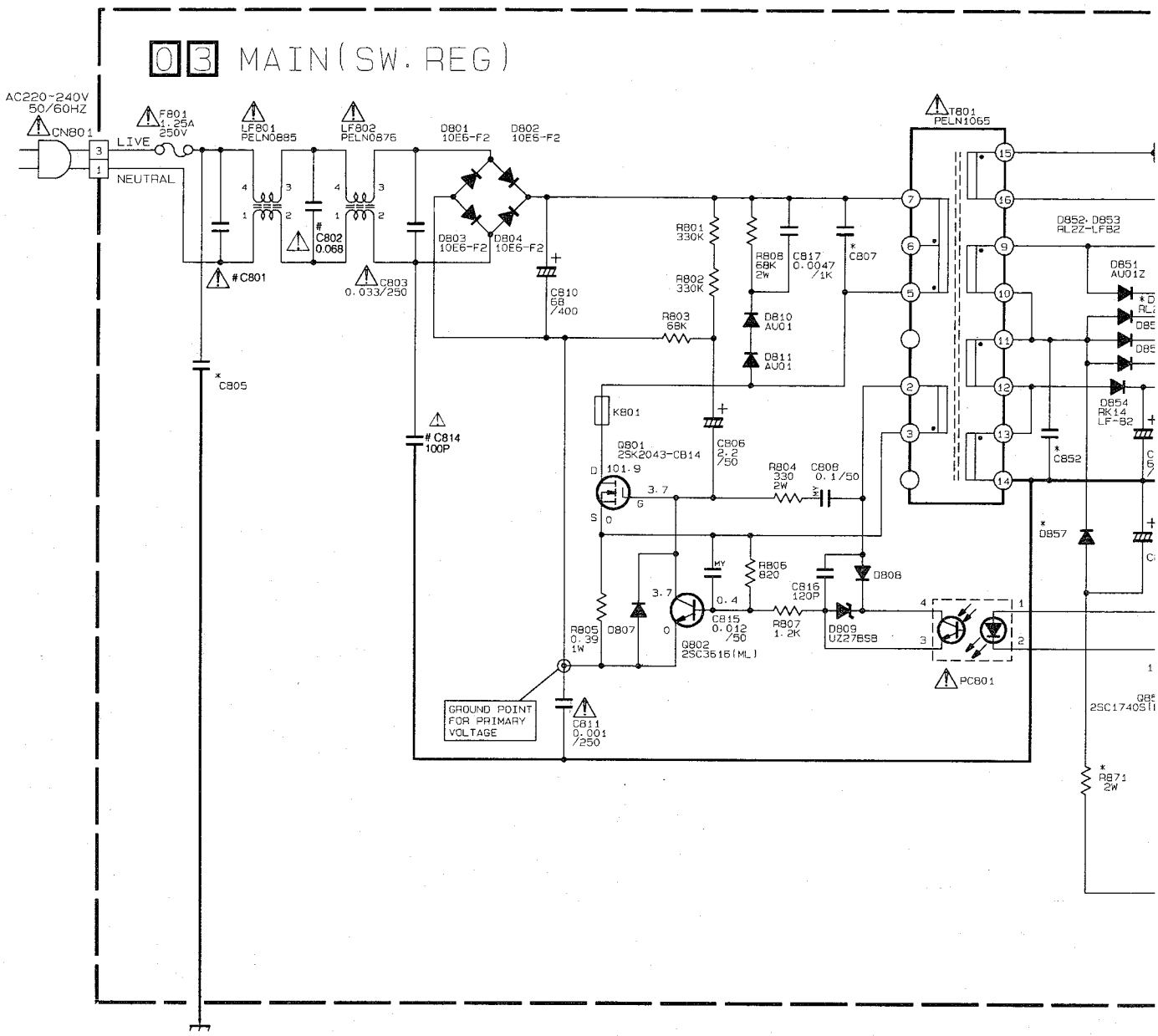

C405
0.001
R404
1K
R405
1K
TO VIDEO
(Page 4-14,16)
V. PULSE
D. FF[V]
C. SYNC
fsc
(-)
1.8
(0)
5.1
4.8
22
23
24
6.5H
VP ON
DFG
DPG
YNR PULSE DET
DUTY DET
VISS DET
6.5H DET
MODE CTL
SI DATA DET
PWM GEN
SYNC SEP
FSC BIT PAT
VD
2.5
0.6
WF4
R414
R410
1K
27P
L401
47μ
TO DRUM MOTOR
CN402
1.6
1.6
0
12.5
4
3
2
1
V CTL
FG/PG
GND[M]
MOTOR 12V
CP401
ICP-N15
TO SYSCON
(Page 4-19)
M12V
GND[M]
GND[C]
SW5V
C418
180P
CAP_FG
V. P_CTL
D. FF
R411
10K
DUTY_I/O
6. 5H_DET
S. DATA
CFG_C/D
CTL_CLOCK
CTL_C/D
D. V. DET
DRUM_CTL_V
CAP_V_CTL
REC_ST[H]

4.9 SYSTEM CONTROL SCHEMATIC DIAGRAM

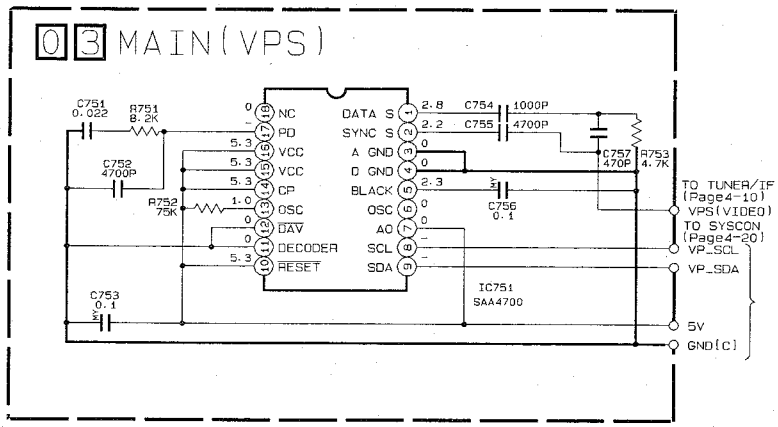



03 MAIN(SYSCON)
TO DISPLAY/SW CN1 (Page 4-32,36)
CN702
LOP1
LOP2
LOP3
LOP4
NC
CASS SW
REC SAFETY
AL 5V
S CLK
S DATA
STB
GND[C]
AC IN
DC[-]
DC[+]
-28V
TO TERMINAL
NOTES: 1 Mark (*) is not used
: 2 COMPARISON CHART OF MODELS & MARKS (#)
REF NO
MODELS
HR-J220E
HR-J221E
HR-E226EG
R635 OPEN USED USED
R660 OPEN OPEN USED
R693 OPEN USED USED
R707 USED USED OPEN
Q602 OPEN USED USED
D612 OPEN OPEN USED
D613 OPEN OPEN USED
CN605 OPEN OPEN USED
TO JOG SHUTTLE
JSA
JSB
GND
SHUTTLE(L)
J2
C2
J1
CN751
VPS[VIDEO]
AL5V
GND
VP SCL
VP SDA
GND
DAV/MODE1
MODE2
TO VPS (Page 4-21)
VPS[VIDEO](NC)
AL5V
GND
VP_SCL
VP_SDA
TO TERMINAL (Page 4-27)
AL5V
GND
VP_SCL
VP_SDA
DAV
SCR[H]
AV2
RAE_OUT/R. PAUSE[NC]
EE[L]
TO VIDEO [Page4-14,16]
VP_SDA/SECAM_DET[NC]
EE[L]
NTSC[L]
CH+_DATA
PB_SPE[L]
CH+_CLOCK
VIDEO_DATA
VIDEO_CLK
SP[L]
FRONT[H](NC)
SG_ON[L]
REC[L]
REC_ST[L]
A/M/S
HEAD_SEL
P_MUTE[L]
MESECAM_DET
AVG_FM
FLY_ERS_ON[L](NC)
A.MUTE[H]
TO AUDIO [Page4-12]
A.MUTE[H]
PEAK2[L]
REC_ST[L]
FRONT[H]
AUX[L]
N.EE[L]
FULL_ERS[L]
N.REC[L]
SP[L]
AL5V
IC607 MS62553P
VSS
DATA
CLOCK
LOP4
LOP3
LOP2
LOP1
VUP
VDD
SG ON[L]
FRONT[H]
AUX[L]
NEE[L]
ERS[L]
NREC[L]
SP[L]
Q602 DTC114WU
Q603 DTC124E
Q607 DTC143EU
Q608 DTC124EU
Q609 DTC124EU
Q610 DTC124E
Q611 DTC124EU
D611
D612 1N4148M
D612 1N4148M
D610 IR-3815B3FM
PS601 PU61433
REEL SENSOR TAKE UP
LED
TP601 TEST
R691 1K
R692
R693 680
R696 470
R697 33K
R700 470
R701 100
R705 10K
R706 10K
R707 10K
R708 10K
R646
R650 10K
R653
R665 10K
R666 10K
R675
R676
R677 220
C624
C625
C626
C627 0.01
C628 100 /5.3
C632
C633
C634
C635
C637
C639
C640

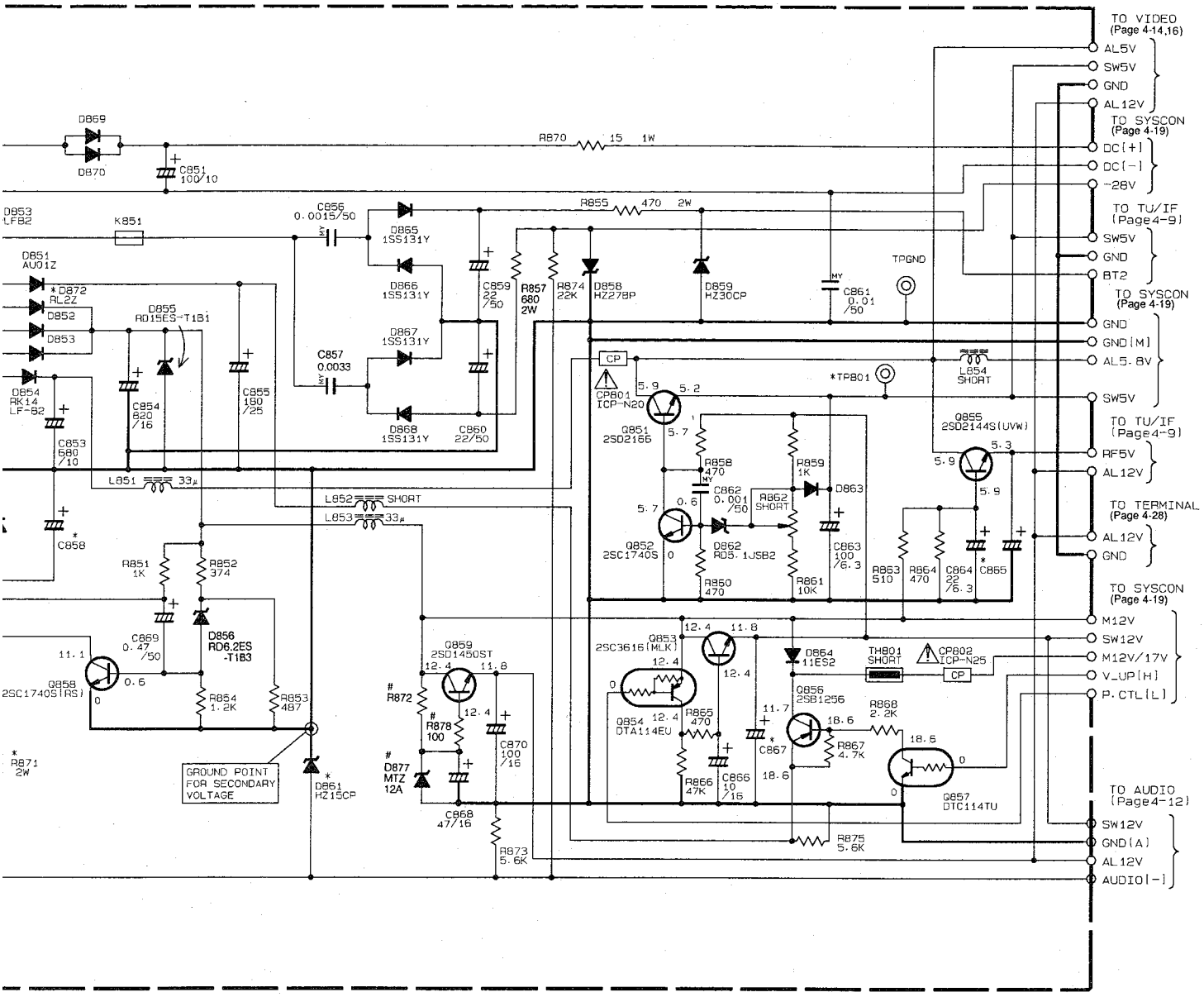
4.10 SWITCHING REGULATOR & VPS SCHEMATIC DIAGRAMS



—HR-E226EG ONLY—



S45062



NOTES : 1 Mark(*) is not used.
: 2 COMPARISON CHART OF MODELS & MARKS (#)

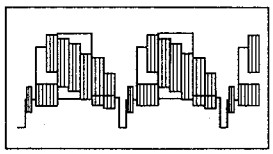
REF. NO	MODELS		
	HR-J220E	HR-J221E	HR-E226EG
R872	100	220	220
R878	OPEN	USED	USED
C801	68K	68K	33K
C802	USED	USED	OPEN
C814	USED	USED	OPEN
D877	OPEN	USED	USED

4.11 MAIN AND A/C HEAD CIRCUIT BOARDS

WAVEFORMS

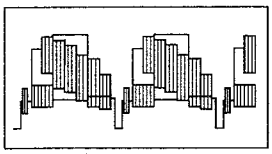
—VIDEO—

WF1 IC201-64



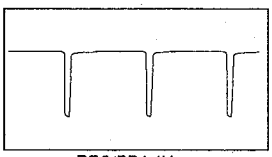
REC/PB2.0Vp-p
50mV/20µsec/DIV

WF2 IC201-60 HR-J220E
IC201-62 HR-J221E/E226EG



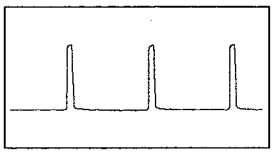
REC1.0Vp-p
20mV/20µsec/DIV

WF3 IC201-55



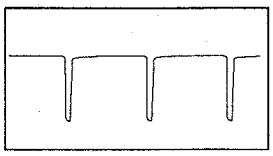
REC/PB4.4Vp-p
0.2V/5msec/DIV

WF4 IC201-52



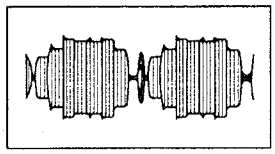
REC4.2Vp-p
0.1V/20µsec/DIV

WF5 IC201-51



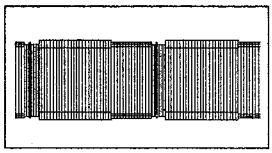
REC4.4Vp-p
0.1V/20µsec/DIV

WF6 IC201-46



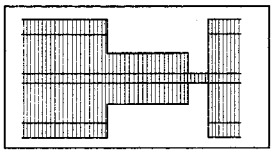
PB0.84Vp-p
20mV/20µsec/DIV

WF7 IC201-45



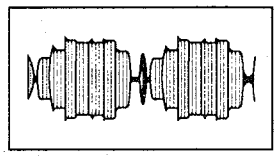
PB0.3Vp-p
10mV/5msec/DIV

WF8 IC201-43



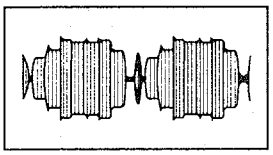
REC0.06Vp-p/PB0.12Vp-p
5mV/5msec/DIV

WF9 IC201-39



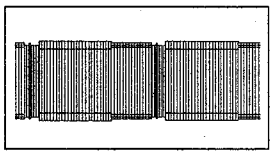
PB0.8Vp-p
20mV/20µsec/DIV

WF10 IC201-33



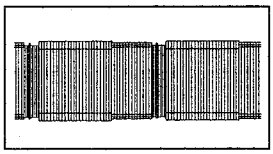
REC0.28Vp-p
10mV/20µsec/DIV

WF11 IC201-19



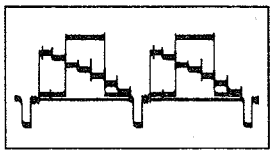
REC1.4Vp-p
50mV/5msec/DIV

WF12 IC201-18



PB0.36Vp-p
10mV/5msec/DIV

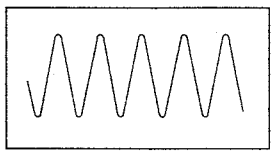
WF13 IC201-11



REC/PB1.0Vp-p
50mV/20µsec/DIV

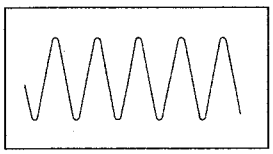
—AUDIO—

WF1 IC1-11



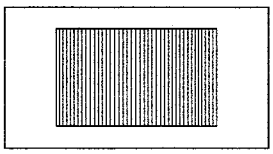
REC0.32Vp-p
10mV/1msec/DIV

WF2 IC1-8



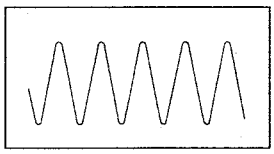
REC3.2Vp-p
0.1V/1msec/DIV

WF3 CN1-1



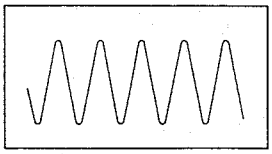
REC43.0Vp-p
2V/1msec/DIV

WF4 IC1-15



PB0.14Vp-p
5mV/1msec/DIV

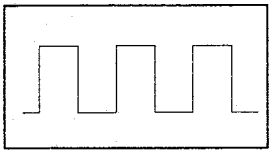
WF5 CN1-4



REC34.0Vp-p
2V/1msec/DIV

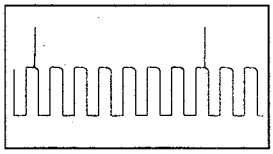
—SERVO—

WF1 IC401-21 D.FF



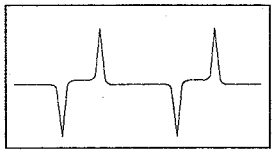
REC/PB5.4Vp-p
0.2V/10msec/DIV

WF2 IC401-22 D.PG/FG



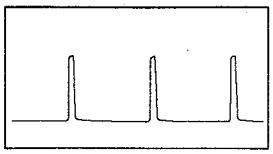
REC/PB4.0Vp-p
0.1V/5msec/DIV

WF3 TP401 CTL PULSE



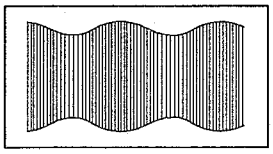
PB2.3Vp-p
0.1V/10msec/DIV

WF4 IC401-2 C.SYNC



REC4.2Vp-p
0.1V/20µsec/DIV

WF5 IC401-17



REC1.8Vp-p
50mV/10msec/DIV

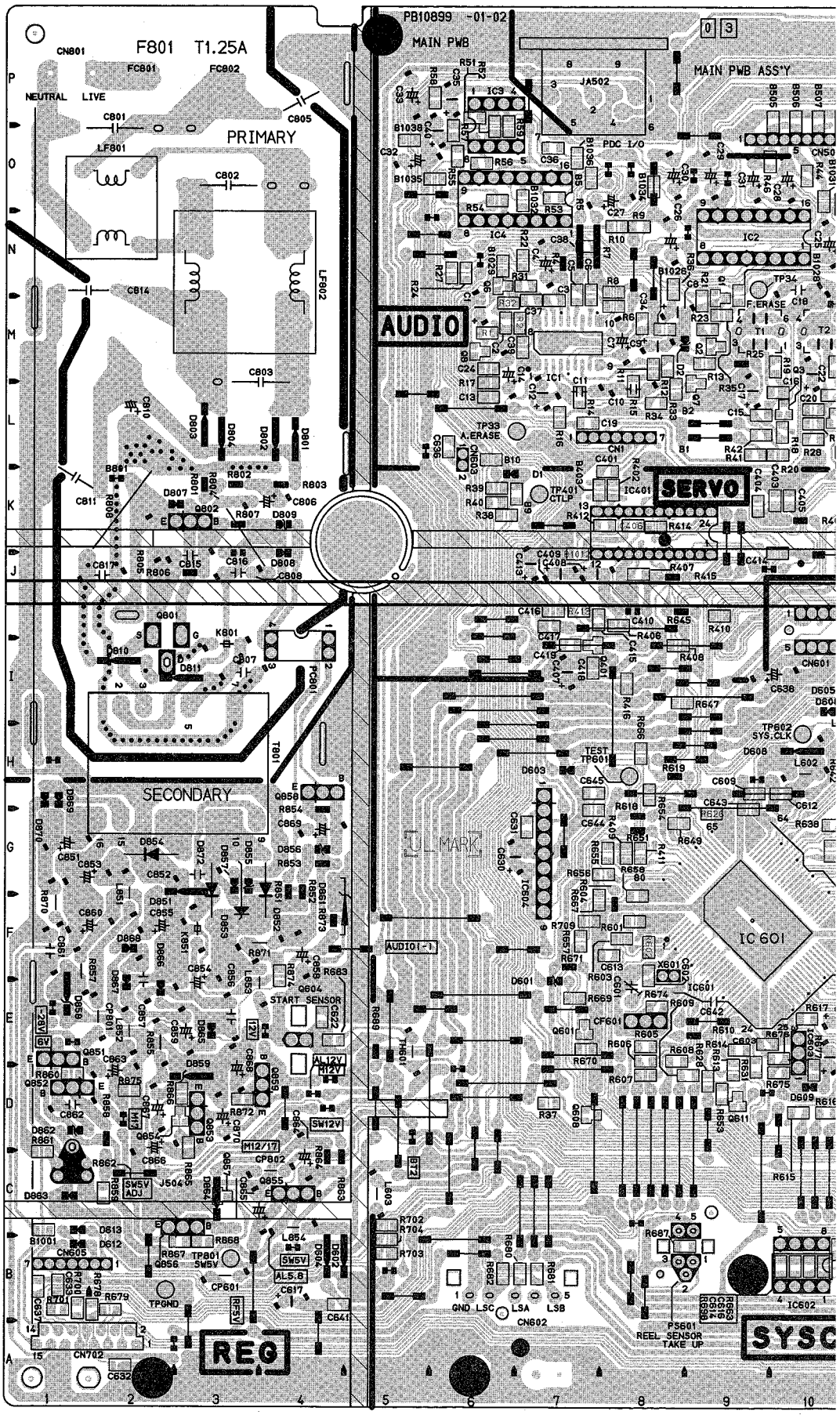
LEADLESS COMPONENT PARTS LOCATION GUIDE <MAIN PWB>

REF.No.	LOCATION
IC	
IC1	7M
TRANSISTOR	
Q1	9N
Q2	9M
Q3	10L
Q4	11N
Q5	10L
Q6	6N
Q7	8M
Q8	6M
Q201	16H
Q202	15H
Q203	13J
Q204	14K
Q205	14H
Q206	17G
Q207	15N
Q208	16N
Q209	16H
Q210	20O
Q211	16G
Q212	17M
Q301	14M
Q302	14M
Q303	16M
Q304	15L
Q305	16L
Q351	19E
Q352	19H
Q353	19H
Q354	19H
Q355	18D
Q356	20I
Q357	19H
Q358	18J
Q359	19J
Q401	17I
Q503	17O
Q601	7E
Q602	12E
Q603	12E
Q607	11F
Q608	7D
Q609	11E
Q610	12M
Q611	9D
Q854	2D
Q857	3C
Q901	21I
Q904	21N
Q905	22N
Q906	21O
Q907	21M
Q908	21M
Q909	21J
DIODE	
D351	19J
RESISTOR	
R1	6M
R2	6M
R6	8M
R8	8M
R9	8N
R10	8N
R11	8M
R12	8M
R13	9M
R14	7L
R15	8L
R16	7L
R17	6M
R18	10L
R19	9M
R20	10L
R21	9N
R22	7N
R23	9M
R24	6N
R26	11N
R27	6N
R28	10L
R29	10L
R30	10M
R31	7N
R32	6M
R33	8L
R34	8L
R35	9M
R36	8N
R37	7D
R38	6K
R39	6K
R40	6K
R41	9L
R42	9L
R43	15O
R44	10O
R45	12O
R46	9O
R47	10N
R48	10O
R49	10N
R50	10O
R51	6P
R52	6P
R53	7O
R54	6O
R55	6O
R56	6O
R57	6O
R58	6P
R59	6O
R201	17I
R202	17H
R203	16G
R204	16H
R205	15H
R206	15H
R207	15H
R208	16H
R209	15G
R210	15I
R211	15I
R212	13I
R213	12I
R214	12J
R215	12J
R216	14H
R217	13G
R218	12J
R219	13G
R220	13G
R221	15J
R222	14J
R223	15K
R224	14J
R226	13K
R227	17I
R228	17I
R229	17G
R230	17F
R231	17F
R232	17F
R233	16F
R234	16F
R235	15F
R237	14O
R238	15N
R240	15N
R241	17N
R245	14L
R246	16H
R247	17J
R248	12L
R249	14L
R250	15H
R251	16J
R252	17M
R253	14I
R254	14I
R271	14I
R272	14H
R301	13N
R303	12M
R304	16M
R305	15M
R306	16N
R307	16L
R308	16K
R309	15L
R310	15L
R311	16L
R312	15L
R352	20E
R353	20F
R354	20F
R355	19F
R356	19F
R357	19E
R358	18F
R359	21E
R360	18F
R361	21E
R363	18H
R364	20G
R365	19G
R366	19G
R367	18G
R368	21G
R369	18G
R370	20H
R371	19H
R372	19H
R373	19H
R374	19E
R375	21E
R376	19D
R378	20I
R379	19J
R380	20I
R381	18I
R382	19J
R384	19I
R385	19I
R386	19I
R387	19I
R388	19I
R402	8K
R404	10L
R405	10L
R406	8J
R407	8J
R408	8I
R409	8G
R410	9J
R411	8G
R412	7K
R413	7J
R414	8K
R416	8I
R504	12P
R506	13P
R511	16P
R512	16P
R601	8F
R602	8F
R603	8F
R605	8E
R606	8E
R607	8D
R608	8E
R609	8D
R611	12F
R612	11F
R613	9E
R614	9E
R615	10D
R616	10D
R617	10E
R620	11E
R621	11E
R622	10B
R624	12F
R625	11E
R626	9G
R627	12D
R628	9D
R629	11G
R630	10I
R631	9E
R632	11G
R633	11G
R635	10G
R636	12E
R637	12F
R638	10G
R639	11H
R640	11H
R641	11H
R642	10H
R643	11F
R646	12N
R647	8I
R648	11G
R649	8G
R650	20B
R653	9D
R654	8H
R655	7G
R656	7G
R657	7F
R658	8G
R660	18C
R661	17D
R662	10B
R663	9B
R665	12D
R666	8H
R667	7F
R668	18B
R669	7E
R670	7E
R672	14B
R674	8E
R675	10D
R676	10E
R677	10E
R678	2B
R679	2B
R680	7B
R681	7B
R682	6B
R683	4E
R684	18E
R685	15B
R686	11D
R687	8B
R688	19E
R692	17D
R693	13F
R696	11E
R697	11D
R698	9B
R700	1B
R701	1B
R702	5C
R703	5B
R704	5B
R705	19C
R706	20C
R707	20C
R709	7F
R751	17C
R752	16C
R753	18C
R859	2C
R860	1D
R861	1D
R865	3C
R866	3D
R867	3B
R868	3B
R872	3D
R874	4F
R875	2D
R901	18L
R902	19L
R903	19M
R904	18M
R905	12O
R907	22N
R908	22N
R909	22M
R910	21N
R913	21N
R914	21M
R915	21M
R916	21M
R917	20P
R918	21P
R919	21P
R920	19O
R930	22K
R931	22J
R932	21J
R933	22K
R934	22J
R935	21J
R936	21J
CAPACITOR	
C2	6M
C3	7N
C5	7N
C6	7N
C13	6L
C15	9L
C16	9L
C19	7L
C20	10L
C21	10L
C24	6M
C34	8M
C36	7O
C37	7M
C38	7N
C39	7M
C201	17I
C202	17H
C203	17I
C204	16G
C205	16I
C208	16H
C209	16I
C210	16I
C211	15H
C212	15H
C213	15G
C214	15H
C215	15I
C217	17H
C218	12H
C219	13I
C220	12I
C221	13I
C222	13J
C223	12J
C224	14I
C225	15H
C227	14H
C229	13G
C231	14I
C232	13H
C233	13I
C234	13I
C238	16J
C240	16J
C242	15J
C243	15K
C244	15J
C245	15K
C246	15J
C248	14J
C249	14K
C250	14J
C253	15I
C254	17F
C255	17F
C256	17F
C257	16F
C258	16G
C260	16G
C261	16F
C263	16F
C264	15F
C265	15F
C266	15F
C269	16M
C271	14L
C272	17G
C275	14H
C276	17G
C277	13L
C278	16F
C279	15I
C280	12L
C281	16F
C302	13M
C309	16L
C312	16L
C316	14M
C352	18G
C353	21E
C356	20F
C358	19G
C359	20G
C360	18F
C361	20F
C362	20E
C365	20H
C367	21G
C368	21G
C371	20D
C372	21G
C375	20E
C377	18D
C378	19D
C380	19D
C382	20D
C384	21D
C387	19H
C388	19J
C389	20I
C390	19F
C391	19G
C392	19H
C401	7L
C403	9K
C404	9K
C405	10K
C406	8K
C414	9K
C415	7J
C416	7J
C417	7J
C418	7I
C419	7I
C501	15P
C502	15P
C503	15P
C504	16O
C505	15O
C506	16P
C602	8F
C603	9E
C605	11D
C606	10G
C607	11I
C608	12E
C609	9H
C610	11H
C611	11H
C612	10H
C613	8F
C614	10B
C615	10B
C616	10B
C620	14B
C622	4E
C623	18D
C624	11G
C625	13C
C626	13B
C627	13C
C631	7G
C632	2A
C633	1B
C634	21D
C635	19C
C636	6L
C637	1B
C639	11L
C640	11F
C641	4B
C643	9H
C644	7G
C645	7H
C751	17C
C752	17C
C754	17C
C755	18B
C757	17C
C902	20L
C904	19K
C905	22N
C908	19K
C909	21O
C950	19K
C951	21L
C952	21L
C953	21K
C954	19O
C955	19O
FERRATE BEADS	
L501	15P
L502	16P
L503	16P
L505	15O

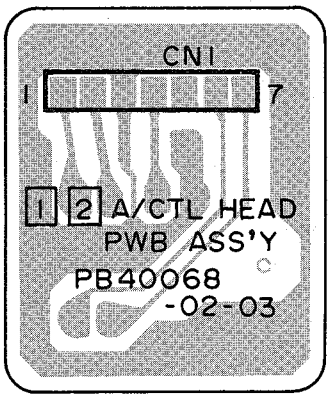
MAIN COMPONENT PARTS LOCATION GUIDE

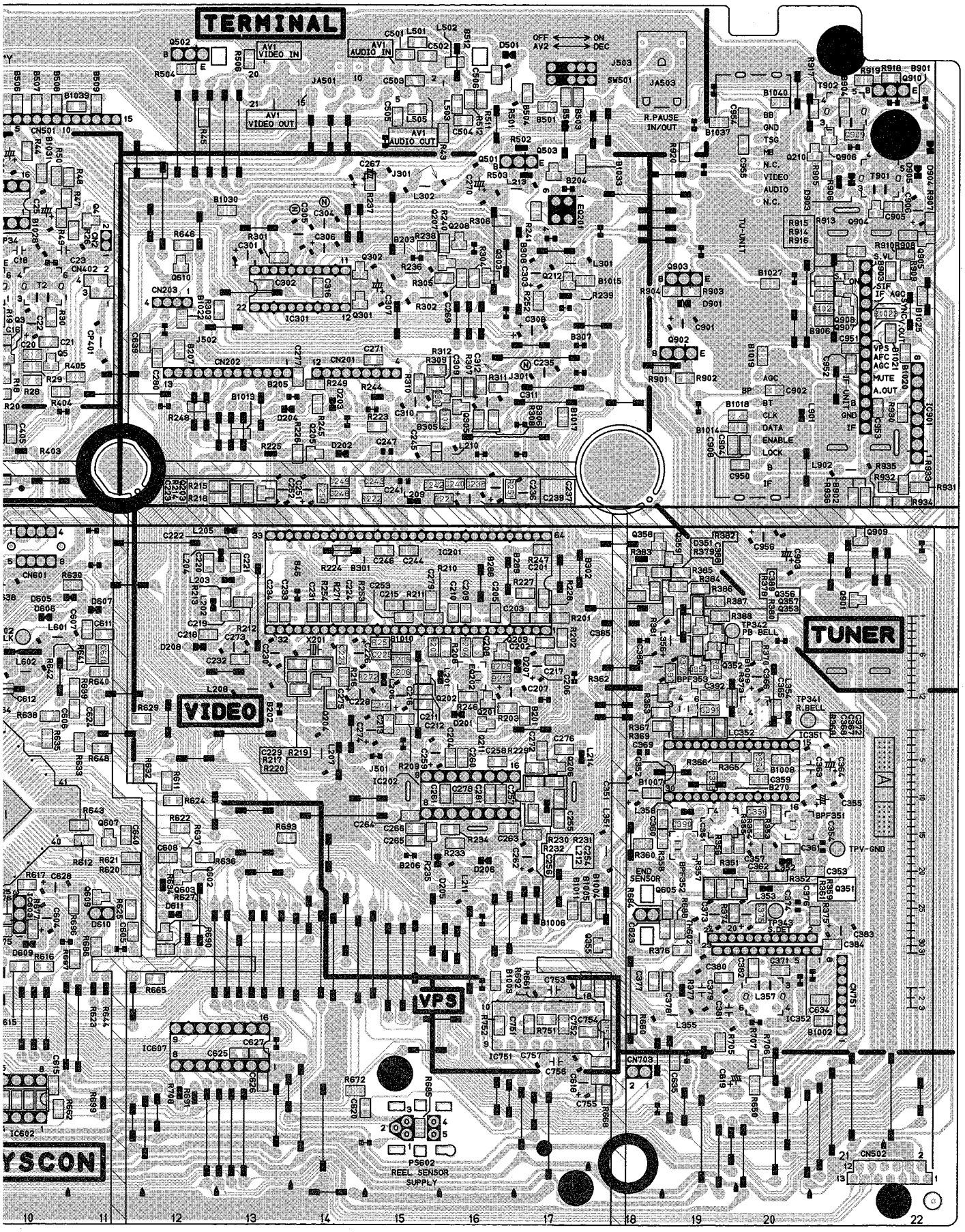
REF.No.	LOCATION
IC	
IC1	7M
IC2	9N
IC3	6P
IC201	15I
IC202	16F
IC301	13M
IC401	8K
IC601	9F
IC602	10B
IC603	10E
IC604	7G
IC607	12C
IC751	17C
TRANSISTOR	
Q1	9N
Q2	9M
Q3	10L
Q202	15H
Q203	13J
Q204	14K
Q205	14H
Q206	17G
Q207	15N
Q208	16N
Q210	20O
Q212	17M
Q301	14M
Q302	14M
Q303	16M
Q501	16O
Q502	12P
Q503	17O
Q601	7E
Q602	12E
Q604	4E
Q605	18E
Q607	11F
Q608	7D
Q609	11E
Q611	9D
Q801	2J
Q802	3K
Q851	1E
Q852	1D
Q853	3D
Q854	2D
Q855	4C
Q856	3C
Q857	3C
Q858	4H
Q859	4D
Q901	21I
Q902	19L
Q903	19M
Q904	21N
Q905	22N
Q906	21O
Q909	21J
DIODE	
D1	7K
D202	14K
D203	14L
D204	13K
D205	15E
D208	12H
D601	7F
D602	4B
D603	7H
D604	4B
D605	10I
D606	10I
D607	11I
D609	10D
D610	11E
D612	2B
D613	2C
D801	4L
D802	4L
D803	3L
D804	3L
D807	2K
D808	4K
D809	4K
D810	2I
D811	3I

REF.No.	LOCATION
D851	2G
D852	4F
D853	3F
D854	2G
D855	3G
D856	4G
D858	1E
D859	3D
D862	1D
D863	1C
D864	3C
D865	3E
D866	2F
D867	2F
D868	2F
D869	1H
D870	1G
D901	19M
D903	21N
D904	22O
D905	22O
CONNECTOR	
CN1	8L
CN2	11N
CN201	14L
CN202	13L
CN402	11M
CN501	10O
CN502	22A
CN601	10J
CN602	7B
CN603	6L
CN605	1B
CN702	1A
CN703	18C
CN801	1P
ADJUSTMENT	
C601	8E
TEST POINT	
TP33	6L
TP401	7K
TP GND	2B
CP	
CP401	11L
CP601	3B
CP801	2E
CP802	4C


PB10899 -01-02
MAIN PWB
MAIN PWB ASS'Y
F801 T1.25A
NEUTRAL
LIVE
PRIMARY
SECONDARY
AUDIO
SERVO
REG
SYSC
IC601
IC602
F.ERASE
A.ERASE
SYS.CLK
START SENSOR
REEL SENSOR TAKE UP
PDC I/O

—A/C HEAD—

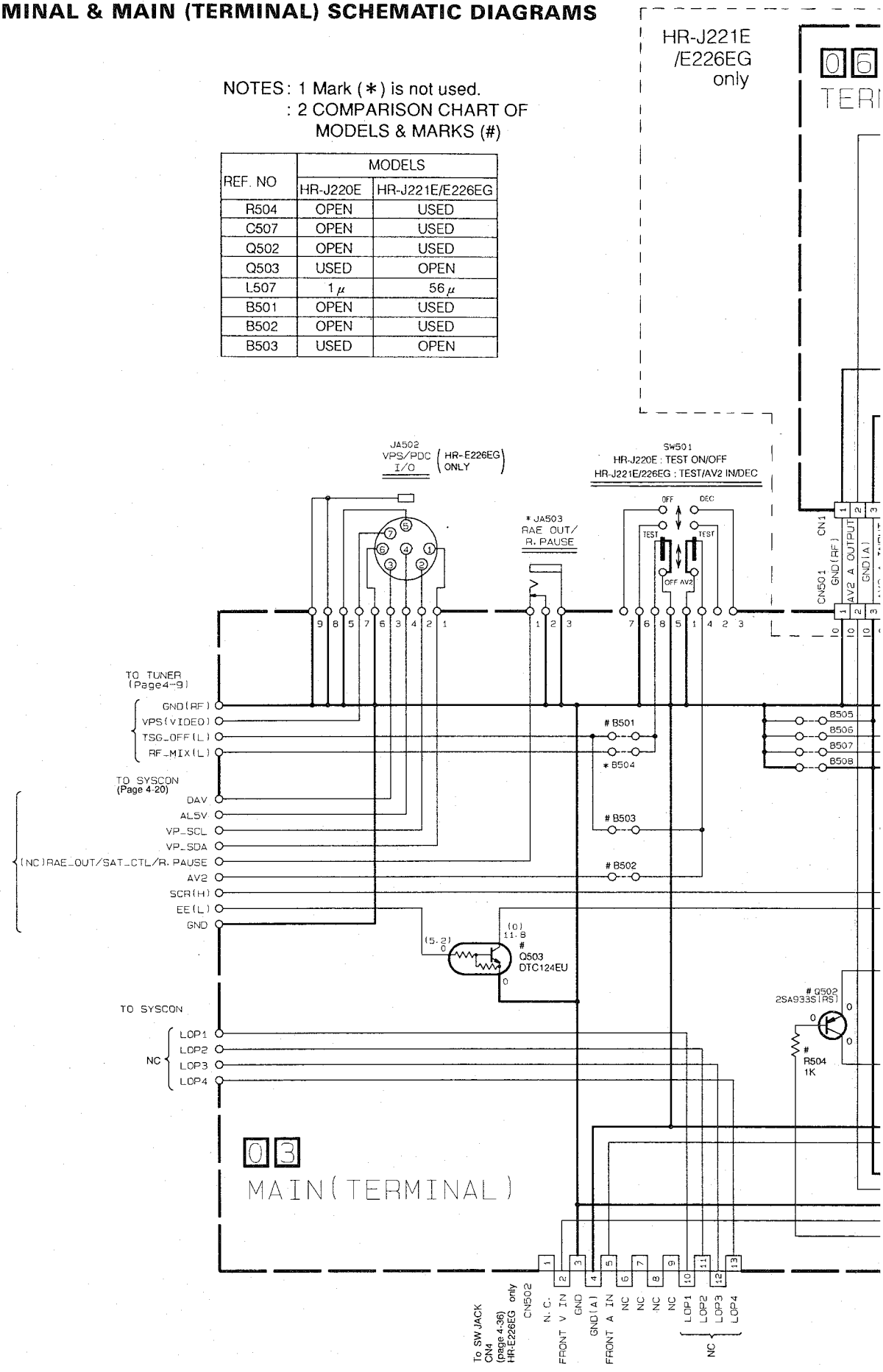

CN1
1
7
1 2 A/CTL HEAD
PWB ASS'Y
PB40068
-02-03

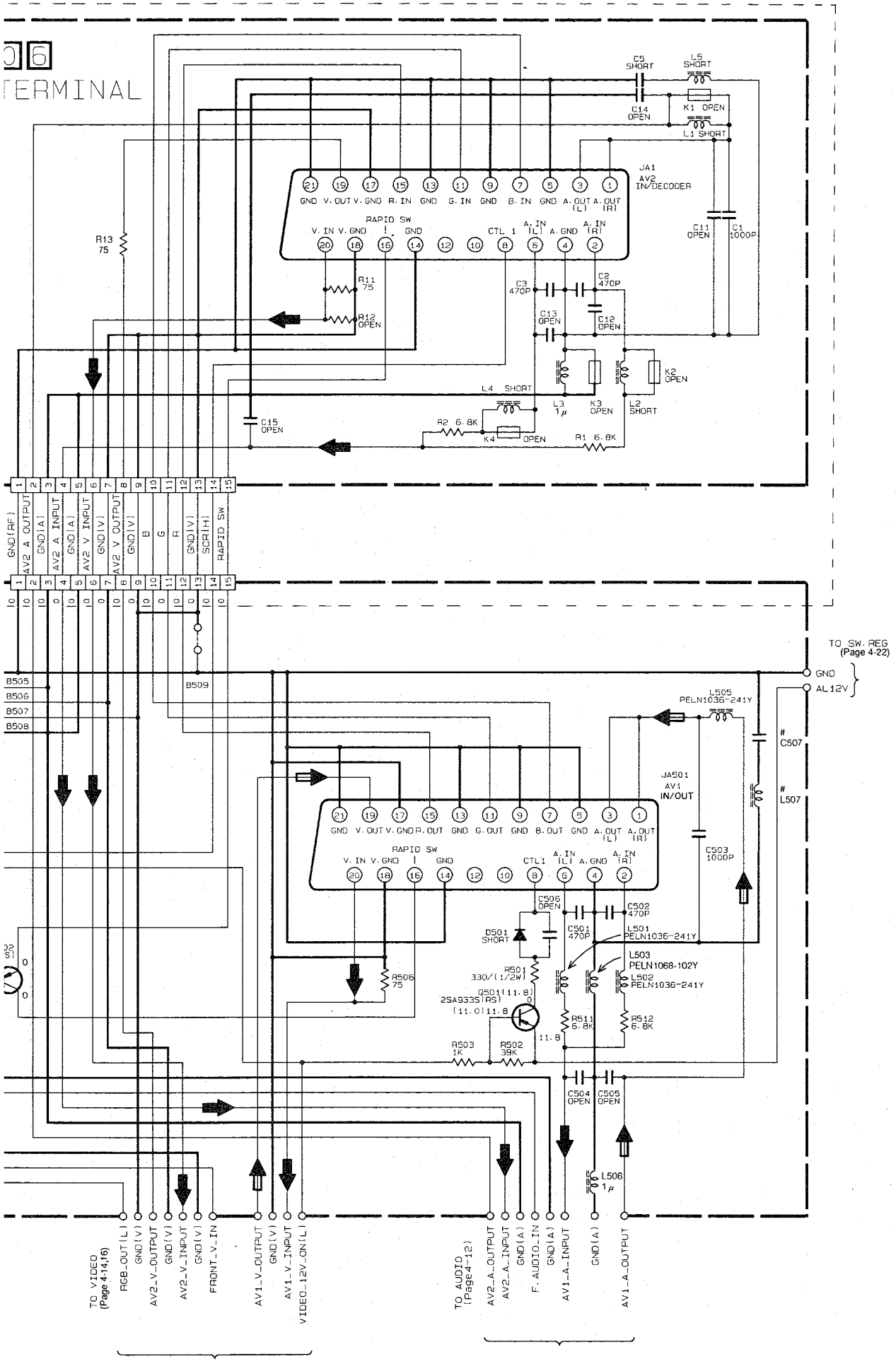

TERMINAL
VIDEO
TUNER
VPS
YSCON
AV1 VIDEO IN
AV1 AUDIO IN
AV1 VIDEO OUT
AV1 AUDIO OUT
OFF ↔ ON
AV2 ↔ DEC
R.PAUSE IN/OUT
BB
GND
TSC
MB
N.C.
VIDEO
AUDIO
N.C.
TU-UNIT
S.VL
S.TU
SIF
IF
AGC
SYNC OUT
VPS
AFC
AGC
MUTE
A.OUT
IF-UNIT
BP
BT
CLK
DATA
ENABLE
LOCK
IF
TP342 PB-BELL
TP341 R.BELL
TPV-GND
TP343 S.DET
END SENSOR
REEL SENSOR SUPPLY
P5602

4.12 TERMINAL & MAIN (TERMINAL) SCHEMATIC DIAGRAMS

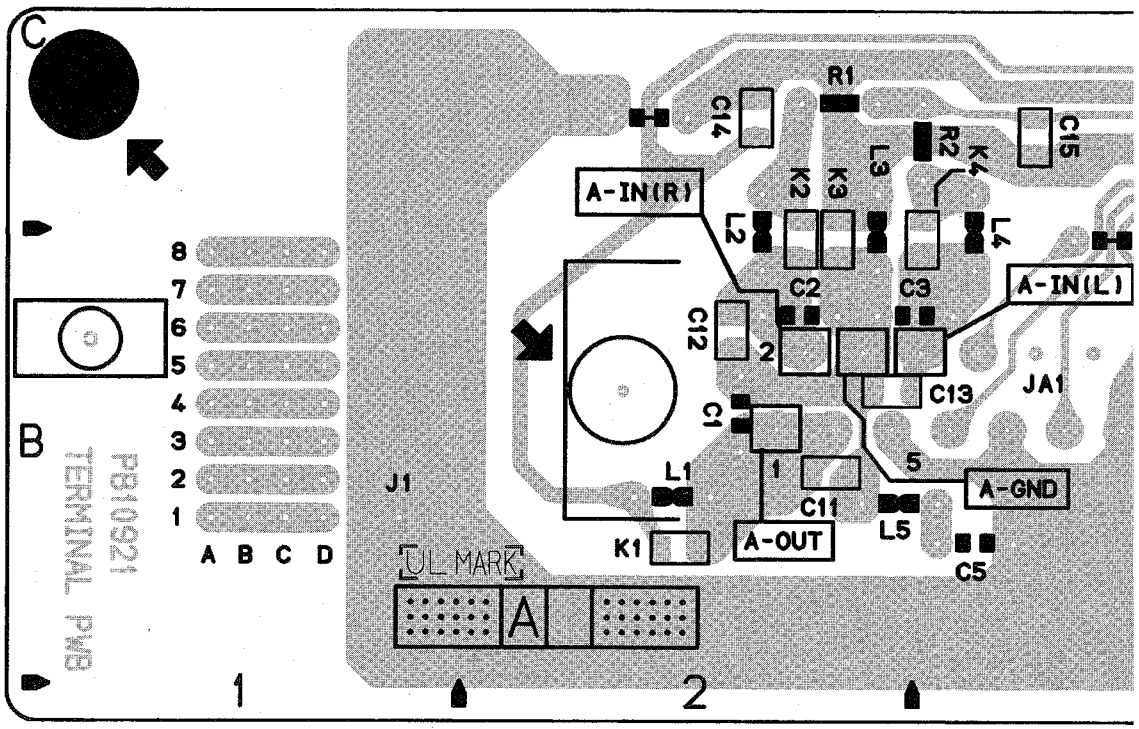
NOTES: 1 Mark (*) is not used.
: 2 COMPARISON CHART OF MODELS & MARKS (#)

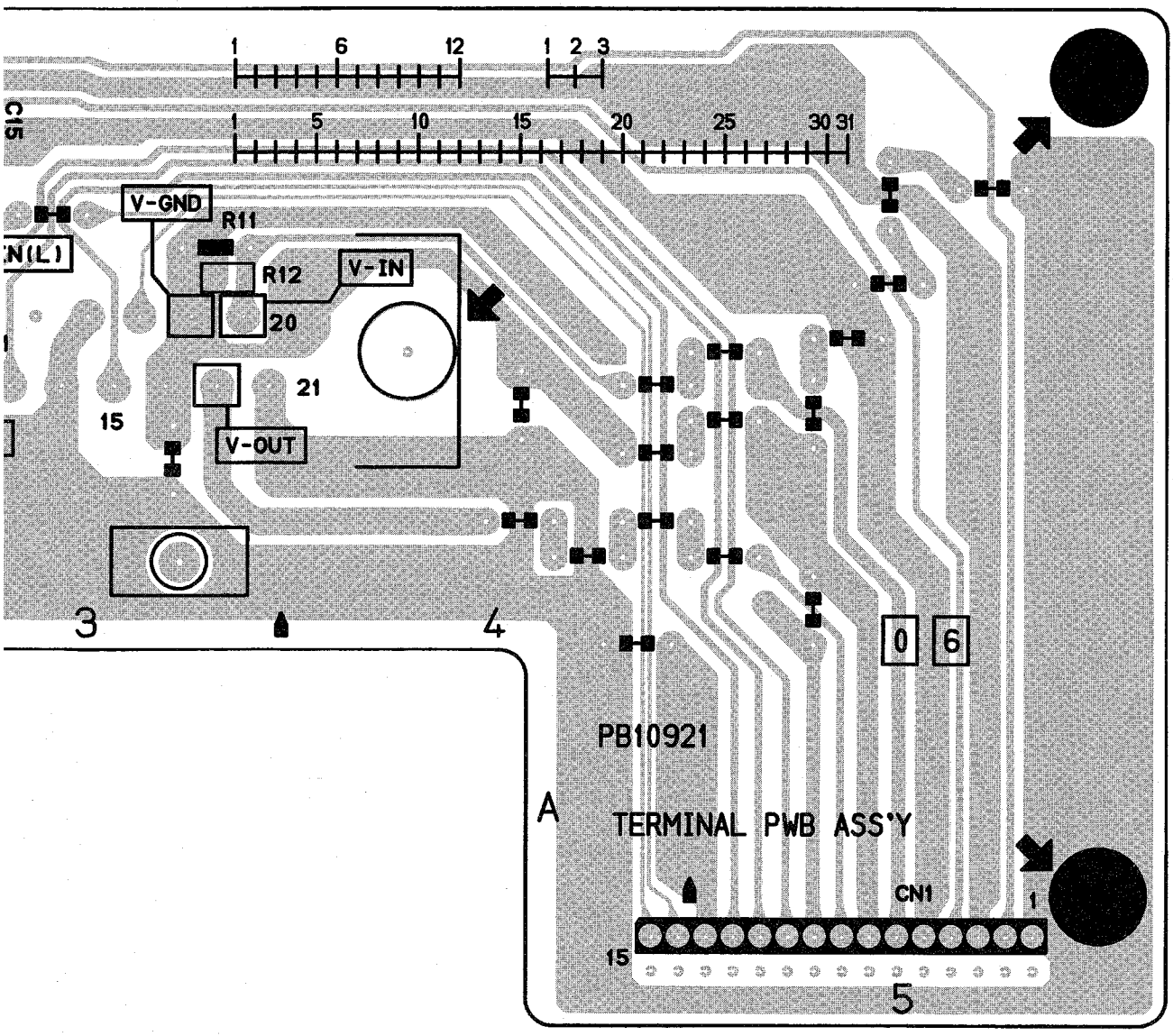
REF. NO	MODELS	
	HR-J220E	HR-J221E/E226EG
R504	OPEN	USED
C507	OPEN	USED
Q502	OPEN	USED
Q503	USED	OPEN
L507	1 μ	56 μ
B501	OPEN	USED
B502	OPEN	USED
B503	USED	OPEN



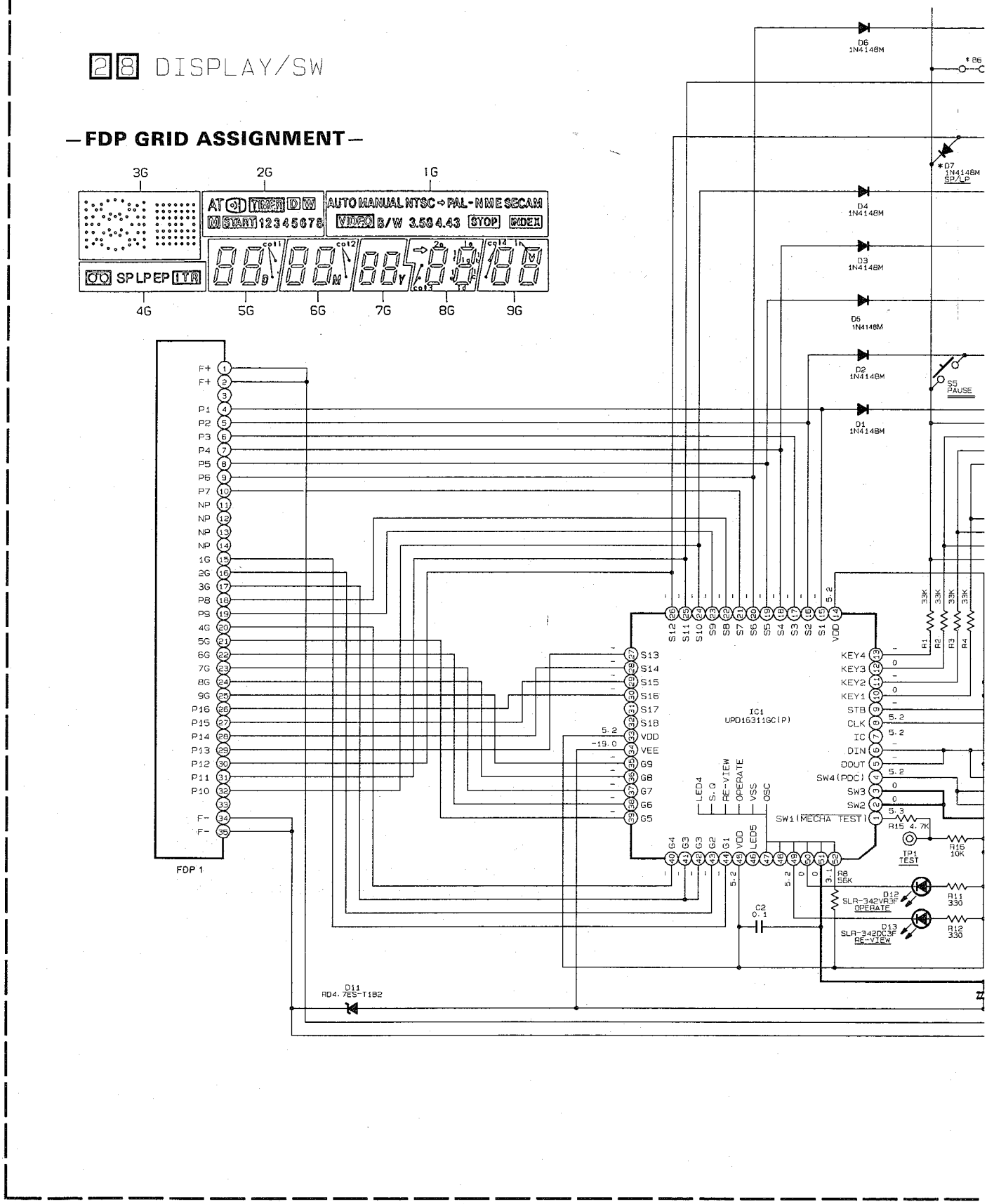

TERMINAL
C5 SHORT
L5 SHORT
C14 OPEN
K1 OPEN
L1 SHORT
JA1
AV2 IN/DECODER
GND V. OUT V. GND R. IN GND G. IN GND B. IN GND A. OUT (L) A. OUT (R)
RAPID SW
V. IN V. GND GND CTL 1 A. IN (L) A. GND A. IN (R)
R13 75
R11 75
R12 OPEN
C3 470P
C2 470P
C13 OPEN
C12 OPEN
C11 OPEN
C1 1000P
K2 OPEN
L4 SHORT
L3 1μ
K3 OPEN
L2 SHORT
C15 OPEN
R2 6.8K
K4 OPEN
R1 6.8K
GND(RF)
AV2 A OUTPUT
GND(A)
AV2 A INPUT
GND(A)
AV2 V INPUT
GND(V)
AV2 V OUTPUT
GND(V)
B
G
R
GND(V)
SCR(H)
RAPID SW
B505
B506
B507
B508
B509
TO SW. REG (Page 4-22)
GND
AL12V
L505 PELN1036-241Y
C507
L507
JA501
AV1 IN/OUT
GND V. OUT V. GND R. OUT GND G. OUT GND B. OUT GND A. OUT (L) A. OUT (R)
RAPID SW
V. IN V. GND GND CTL1 A. IN (L) A. GND A. IN (R)
C503 1000P
C506 OPEN
C502 470P
D501 SHORT
C501 470P
L501 PELN1036-241Y
L503 PELN1068-102Y
L502 PELN1036-241Y
R501 330/(1/2W)
Q501(11.8) 2SA933S(RS) (11.0)11.8
R506 75
R511 6.8K
R512 6.8K
11.8
R503 1K
R502 39K
C504 OPEN
C505 OPEN
L506 1μ
TO VIDEO (Page 4-14,16)
RGB_OUT(L)
GND(V)
AV2_V_OUTPUT
GND(V)
AV2_V_INPUT
GND(V)
FRONT_V_IN
AV1_V_OUTPUT
GND(V)
AV1_V_INPUT
VIDEO_12V_ON(L)
TO AUDIO (Page4-12)
AV2_A_OUTPUT
AV2_A_INPUT
GND(A)
F. AUDIO_IN
GND(A)
AV1_A_INPUT
GND(A)
AV1_A_OUTPUT

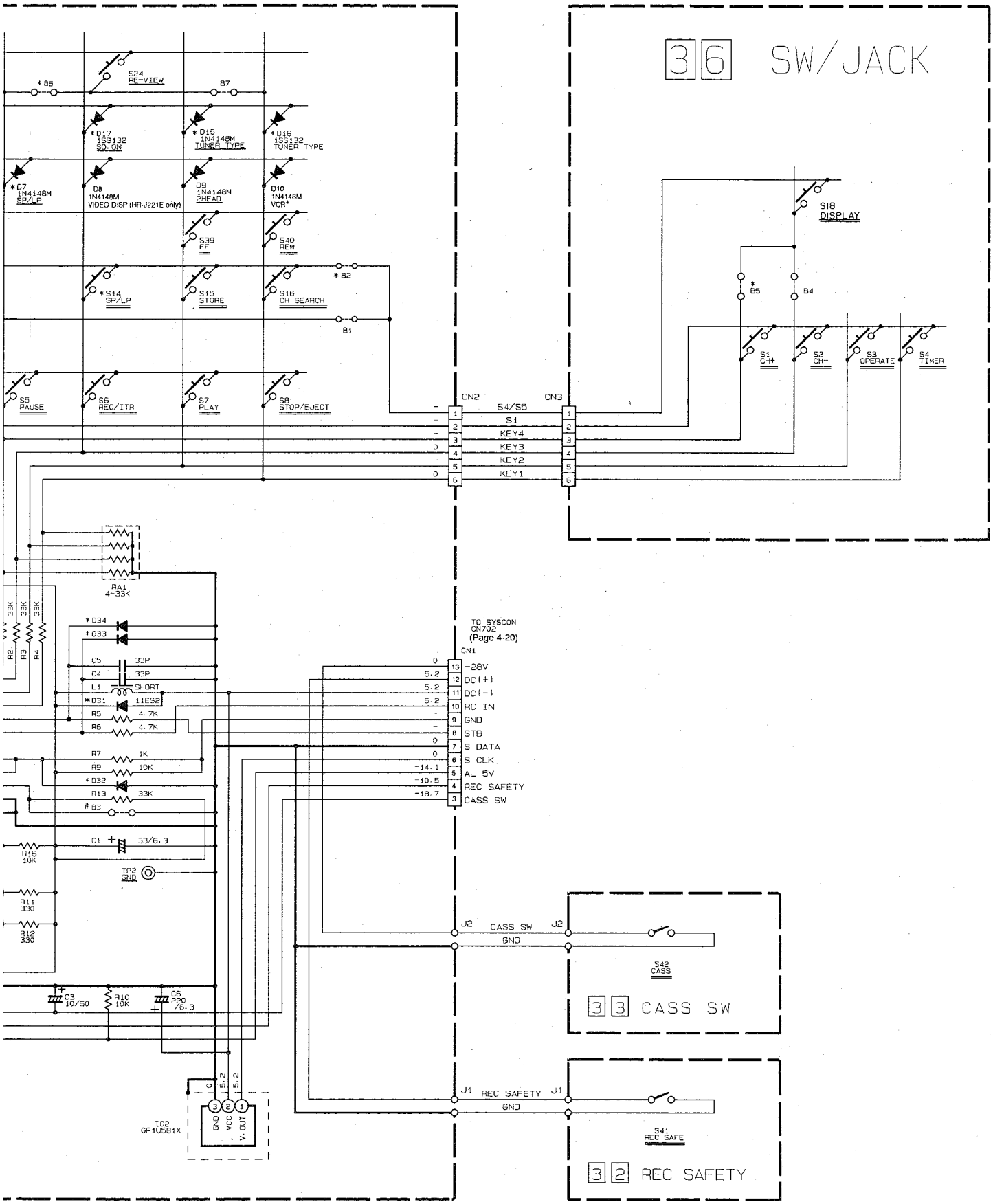
4.13 TERMINAL CIRCUIT BOARD




1 6 12
1 2 3
1 5 10 15 20 25 30 31
C15
V-GND
R11
R12
V-IN
20
21
15
V-OUT
3
4
0 6
PB10921
A
TERMINAL PWB ASS'Y
CN1
1
15
5

4.14 DISPLAY/SW & SW/JACK SCHEMATIC DIAGRAMS (for HR-J220E/J221E)

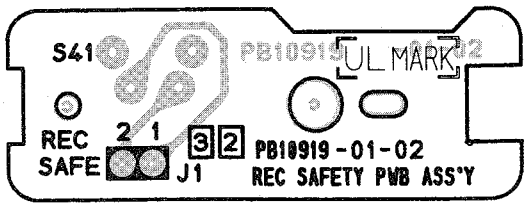




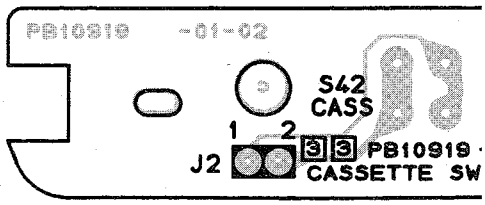
NOTE: Mark(*)is not used.

4.15 DISPLAY/SW, SW/JACK, REC SAFETY AND CASSETTE SW CIRCUIT BOARDS (for HR-

–REC SAFETY–



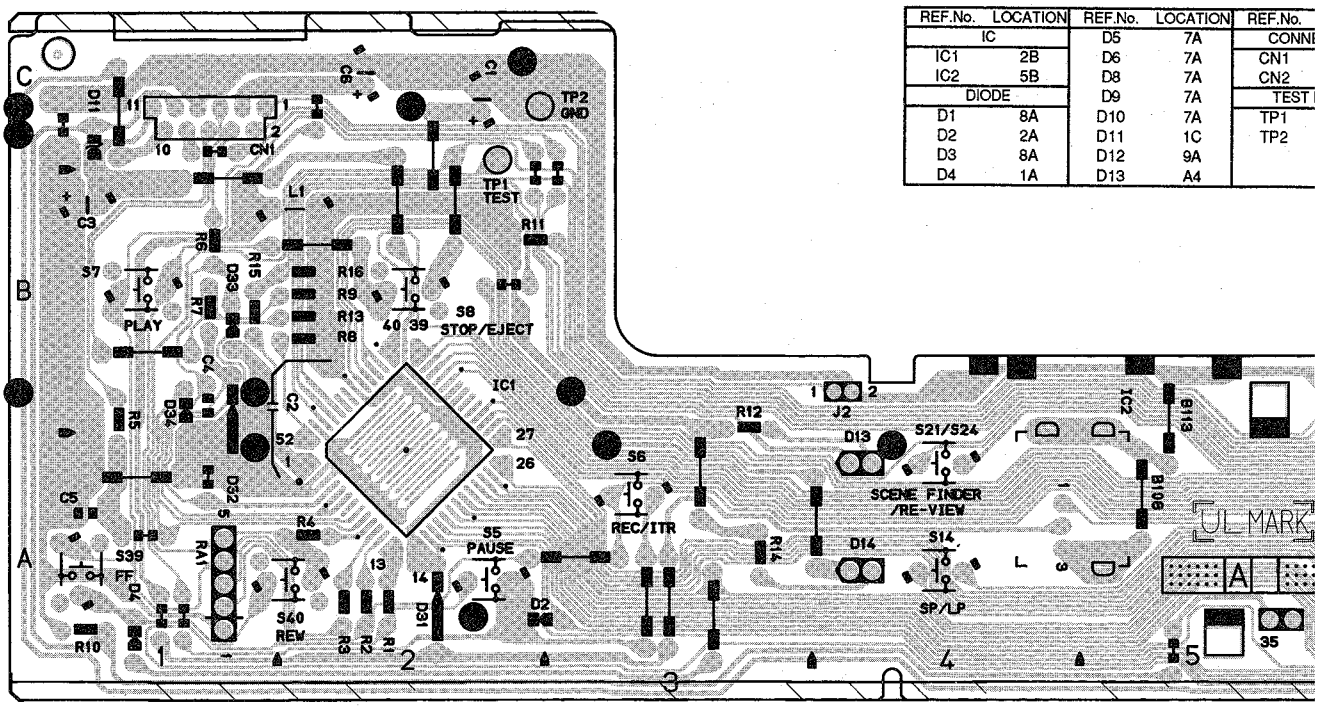
–CASSETTE SW–



–DISPLAY/SW–

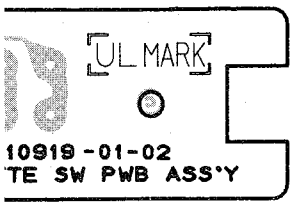
MAIN COMPONENT PARTS LOCATION GUIDE <DISP

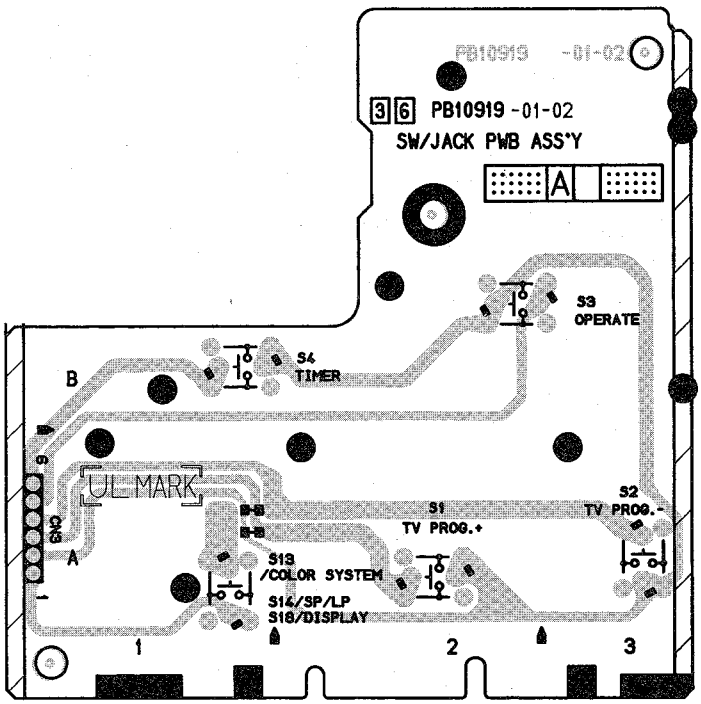
REF.No.	LOCATION	REF.No.	LOCATION	REF.No.
IC		D5	7A	CONN
IC1	2B	D6	7A	CN1
IC2	5B	D8	7A	CN2
DIODE		D9	7A	TEST
D1	8A	D10	7A	TP1
D2	2A	D11	1C	TP2
D3	8A	D12	9A	
D4	1A	D13	A4	



—SW/JACK—

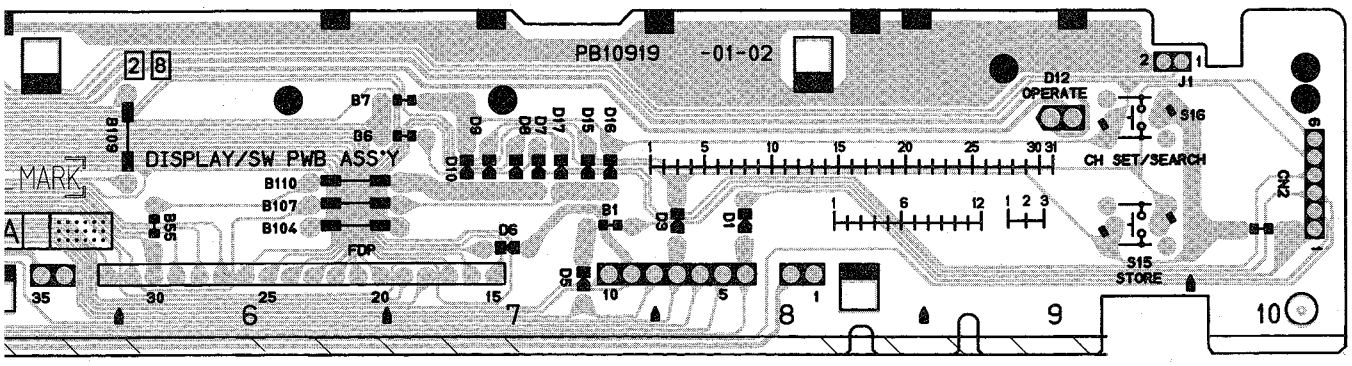
: SW—



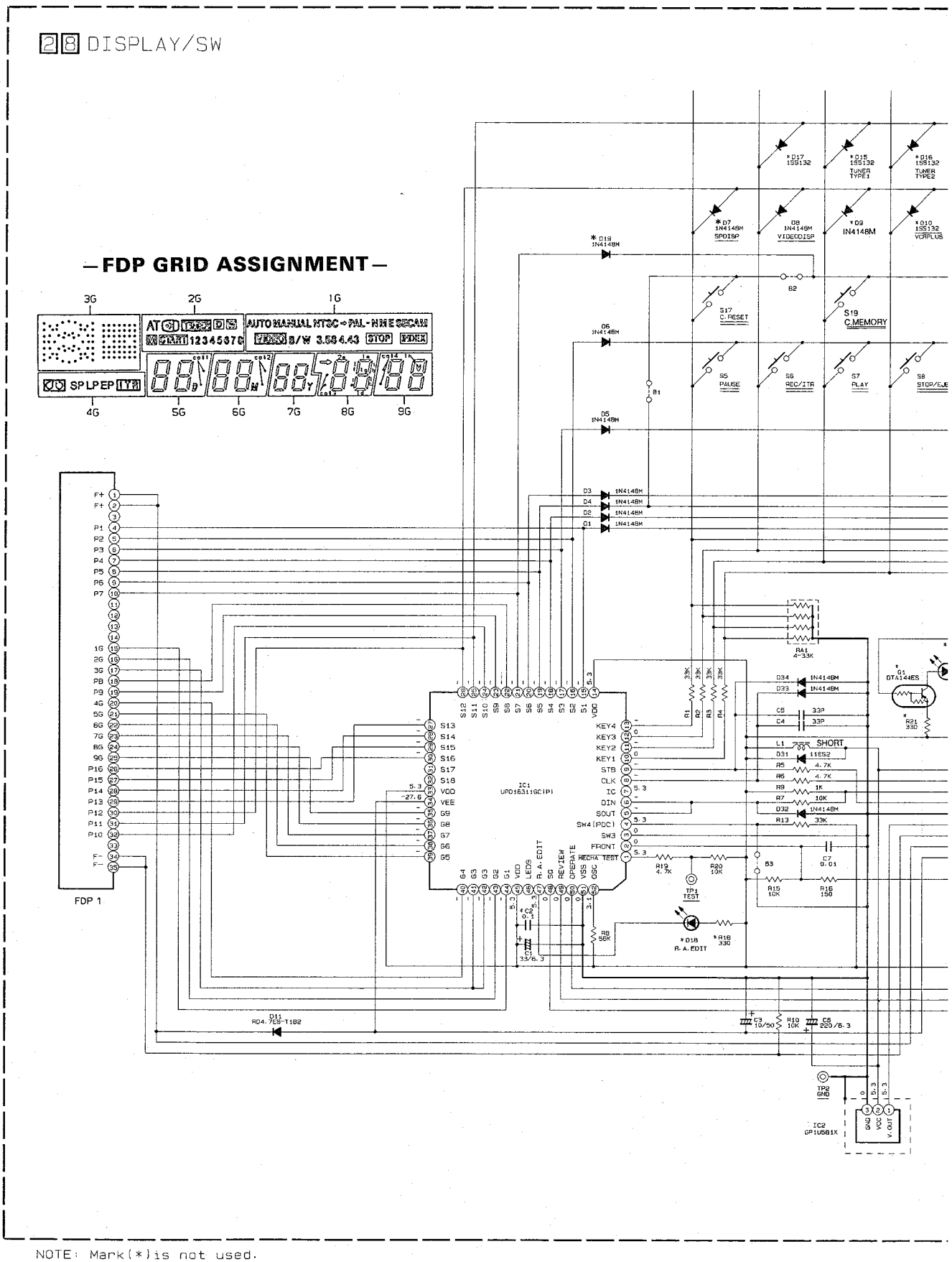


JIDE <DISPLAY/SW PWB>

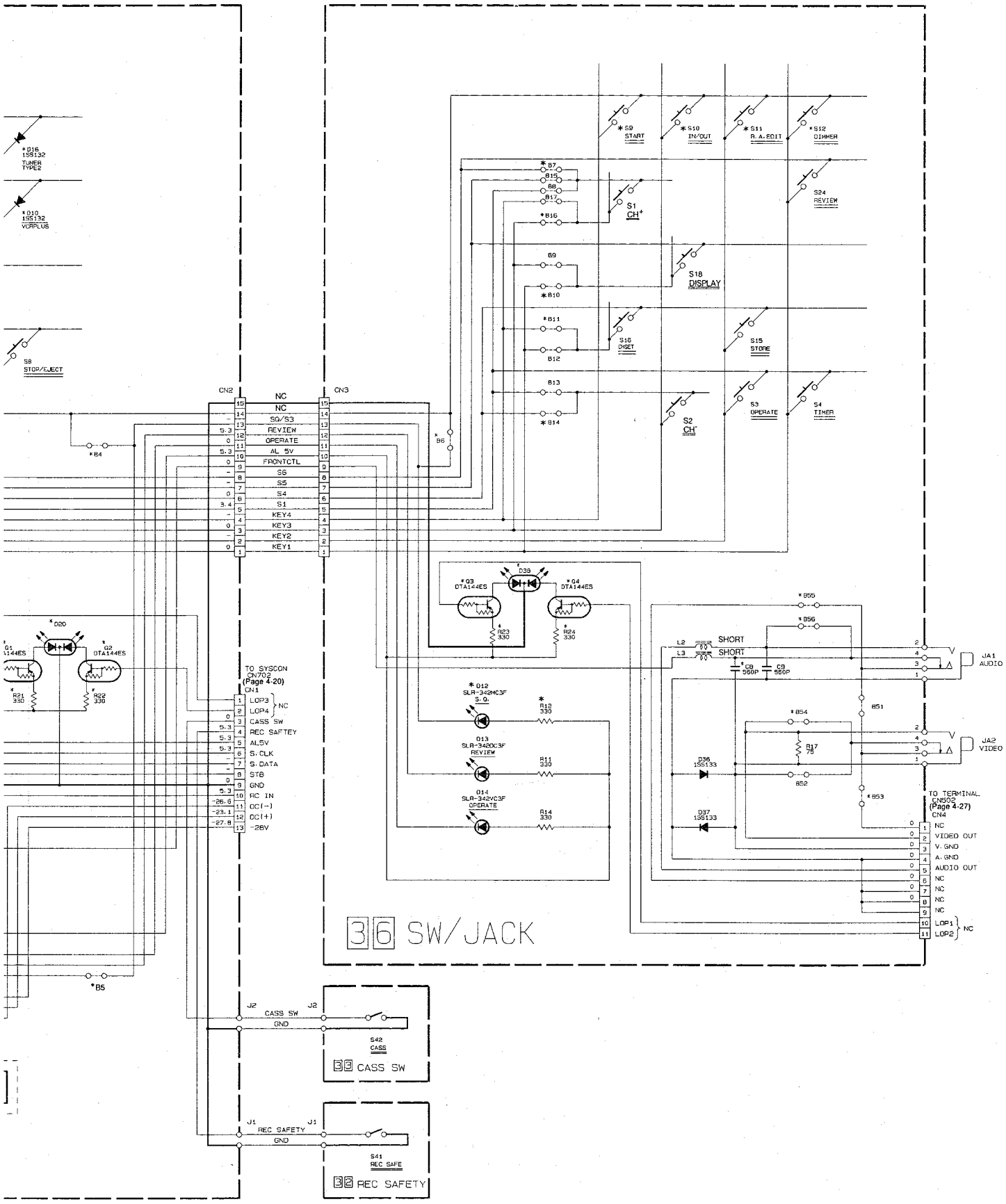
REF.No.	LOCATION
CONNECTOR	
CN1	1C
CN2	10A
TEST POINT	
TP1	2B
TP2	2C



4.16 DISPLAY/SW & SW/JACK SCHEMATIC DIAGRAMS (for HR-E226EG)

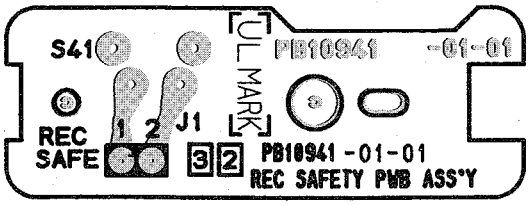


NOTE: Mark(*)is not used.

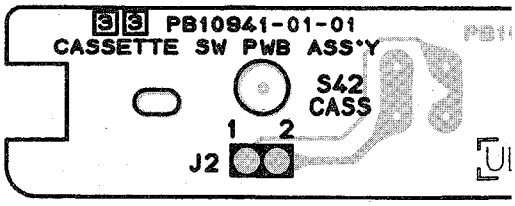

*D16 1SS132 TUNER TYPE2
*D10 1SS132 VCRPLUS
S8 STOP/EJECT
CN2
CN3
NC
NC
SQ/S3
REVIEW
OPERATE
AL 5V
FRONTCTL
S6
S5
S4
S1
KEY4
KEY3
KEY2
KEY1
*B4
*B5
*B6
*B7
B15
B8
B17
*B16
B9
*B10
*B11
B12
B13
*B14
*S9 START
*S10 IN/OUT
*S11 A.A.EDIT
*S12 DIMMER
S1 CH+
S24 REVIEW
S18 DISPLAY
S16 DSET
S15 STORE
S2 CH-
S3 OPERATE
S4 TIMER
*D3 DTA144ES
*D39
*D4 DTA144ES
*R23 330
*R24 330
*D20
*G1 DTA144ES
*G2 DTA144ES
*R21 330
*R22 330
TO SYSCON CN702 (Page 4-20)
CN1
LOP3
LOP4
NC
CASS SW
REC SAFTEY
AL5V
S.CLK
S.DATA
STB
GND
RC IN
CC(-)
CC(+)
-28V
*D12 SLR-342MC3F S.D.
*R10
D13 SLR-342DC3F REVIEW
R11 330
D14 SLR-342VC3F OPERATE
R14 330
*B55
*B56
L2 SHORT
L3 SHORT
*C8 560P
C9 560P
JA1 AUDIO
*B54
B51
*R17 75
B52
D36 1SS133
D37 1SS133
*B53
JA2 VIDEO
TO TERMINAL CN602 (Page 4-27)
CN4
NC
VIDEO OUT
V.GND
A.GND
AUDIO OUT
NC
NC
NC
NC
LOP1
LOP2
NC
36 SW/JACK
J2
CASS SW
GND
S42 CASS
33 CASS SW
J1
REC SAFETY
GND
S41 REC SAFE
32 REC SAFETY

4.17 DISPLAY/SW, SW/JACK, REC SAFETY AND CASSETTE SW CIRCUIT BOARDS (for HR

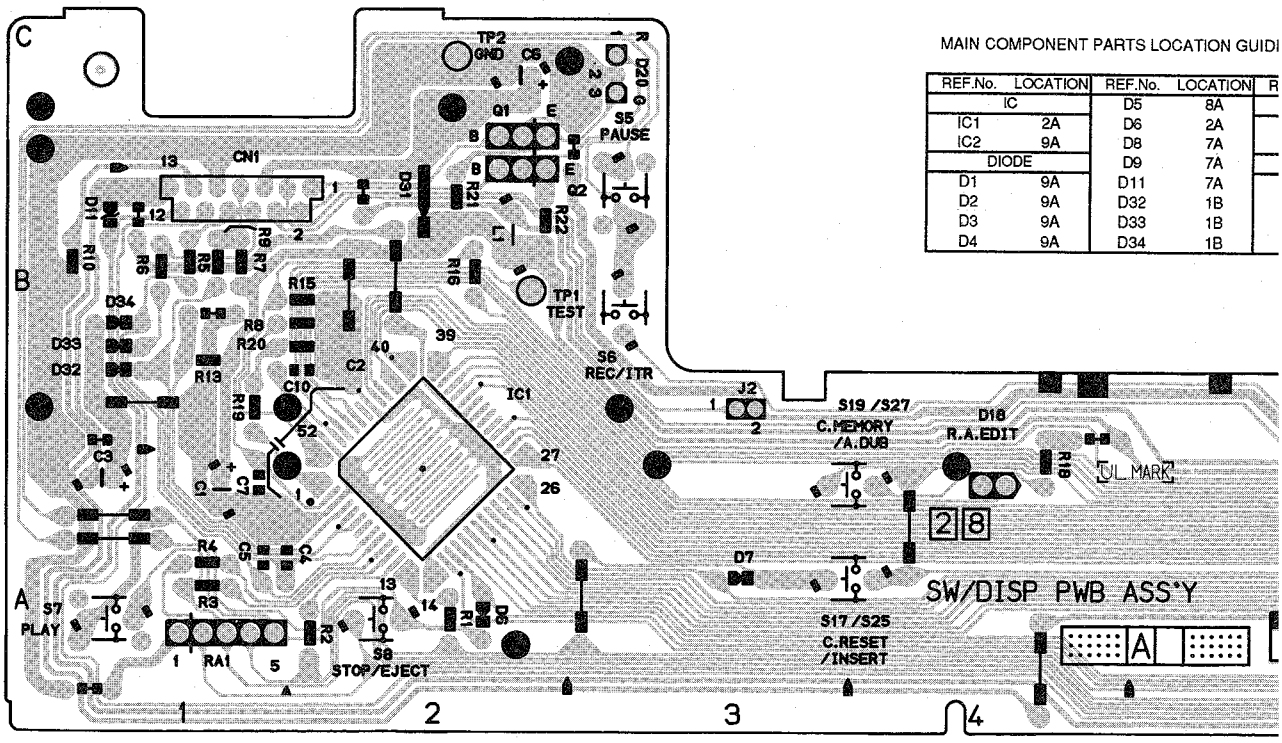
–REC SAFETY–



–CASSETTE SW–



–DISPLAY/SW–

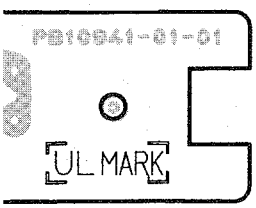


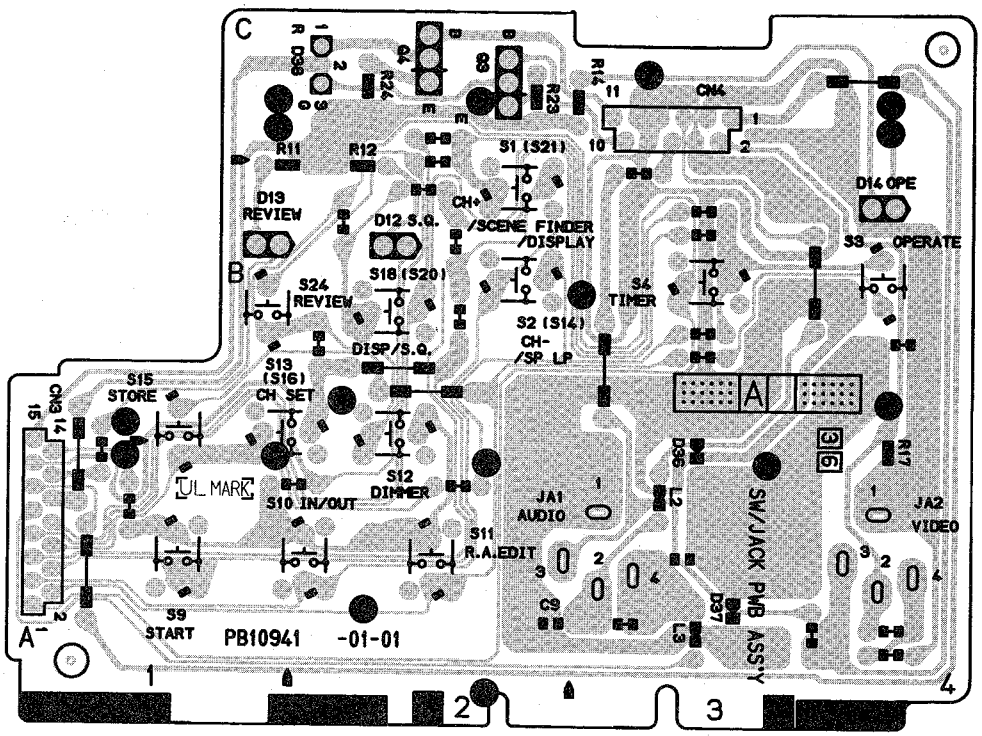
MAIN COMPONENT PARTS LOCATION GUIDI

REF.No.	LOCATION	REF.No.	LOCATION	R
IC		D5	8A	
IC1	2A	D6	2A	
IC2	9A	D8	7A	
DIODE		D9	7A	
D1	9A	D11	7A	
D2	9A	D32	1B	
D3	9A	D33	1B	
D4	9A	D34	1B	

—SW/JACK—

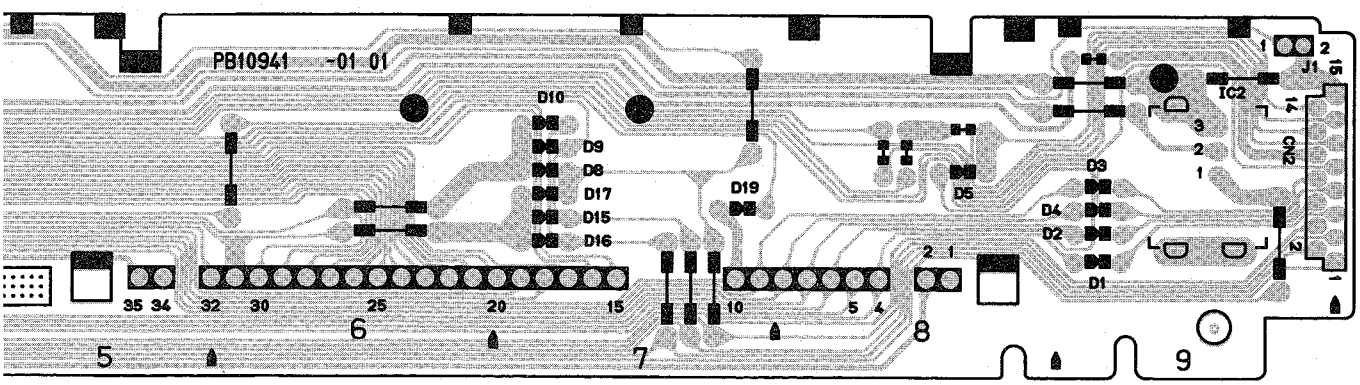
W—



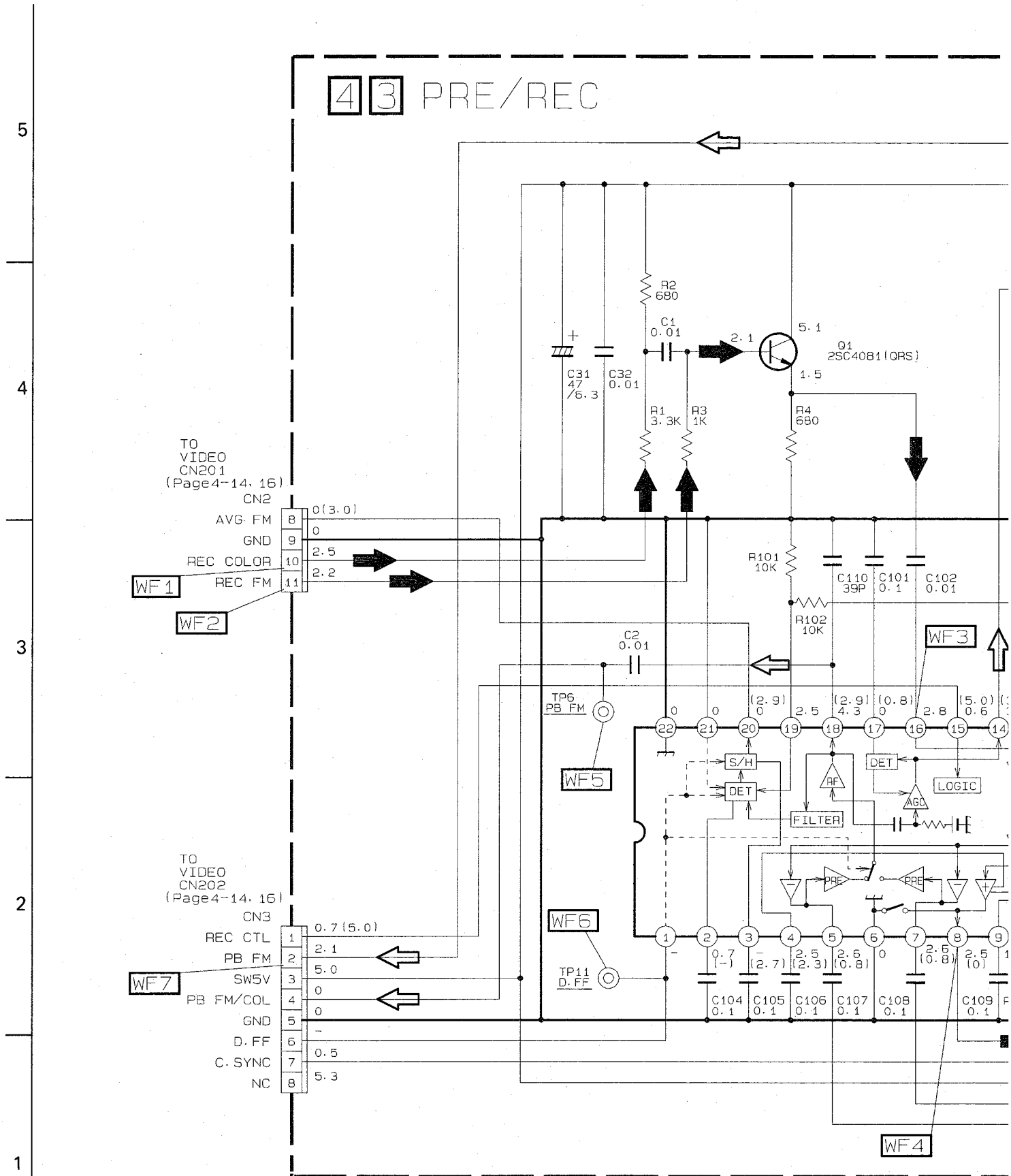


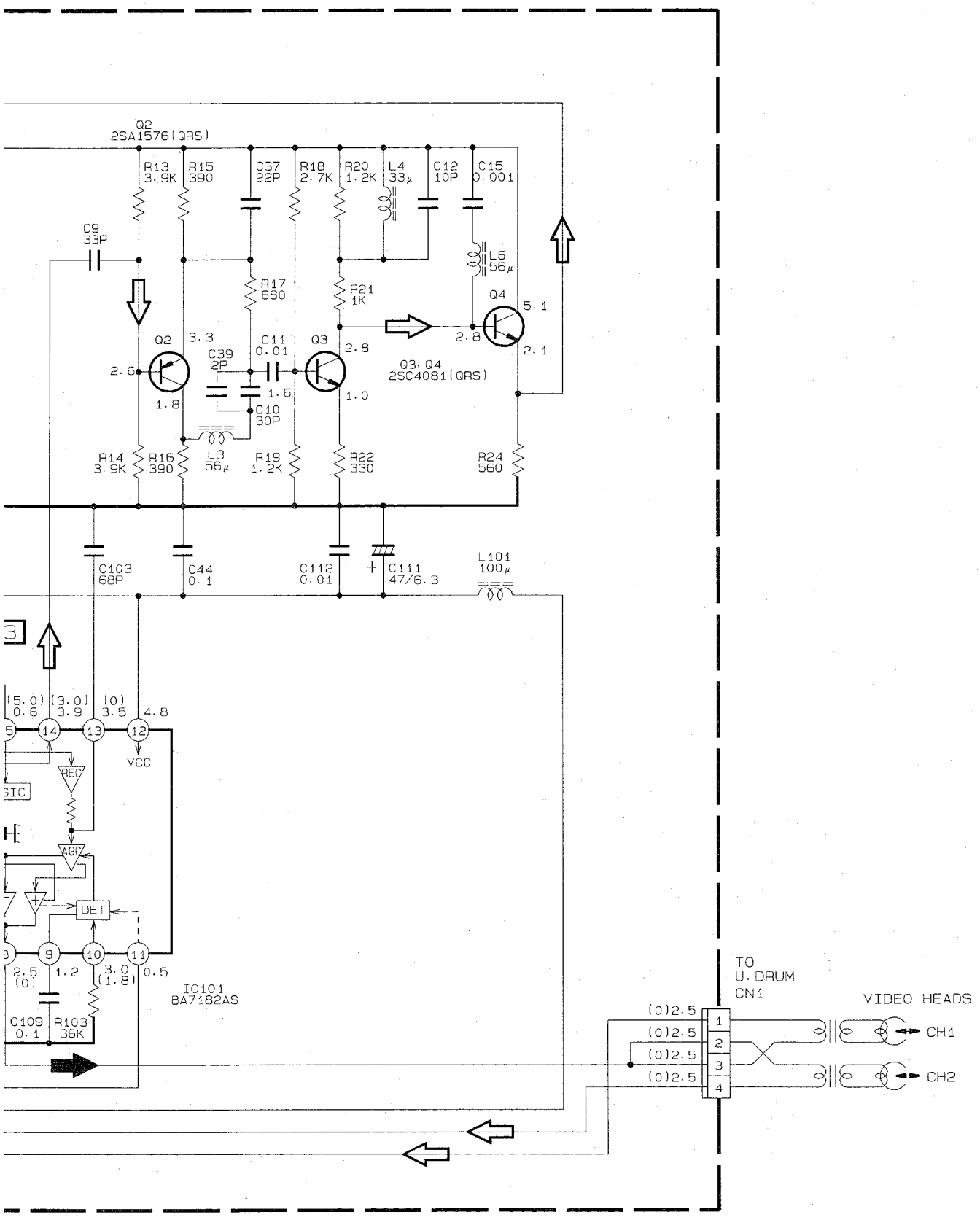
ION GUIDE <DISPLAY/SW PWB>

CATION	REF.No.	LOCATION
8A	CONNECTOR	
2A	CN1	1B
7A	CN2	9A
7A	TEST POINT	
7A	TP1	2B
1B	TP2	2C
1B		
1B		



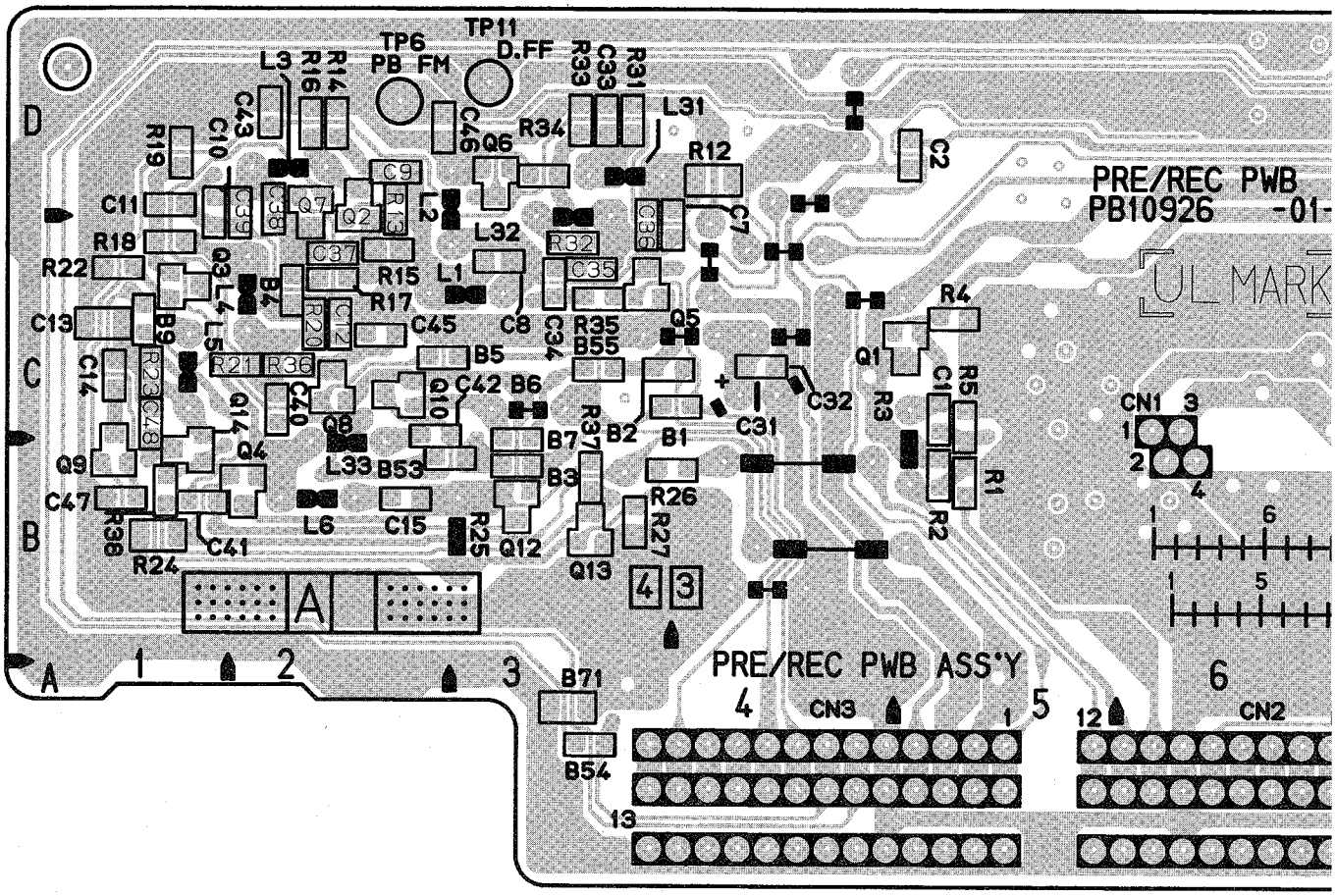
4.18 PRE/REC SCHEMATIC DIAGRAM




Q2
2SA1576(QRS)
R13
3.9K
R15
390
C37
22P
R18
2.7K
R20
1.2K
L4
33μ
C12
10P
C15
0.001
C9
33P
L6
56μ
R17
680
R21
1K
Q4
5.1
2.8
2.1
Q2
3.3
C11
0.01
Q3
2.8
2.6
C39
2P
Q3, Q4
2SC4081(QRS)
1.6
1.8
1.0
C10
30P
R14
3.9K
R16
390
L3
56μ
R19
1.2K
R22
330
R24
560
C103
68P
C44
0.1
C112
0.01
C111
47/6.3
L101
100μ
(5.0)
0.6
(3.0)
3.9
(0)
3.5
4.8
VCC
REC
AGC
DET
2.5
(0)
1.2
3.0
(1.8)
0.5
IC101
BA7182AS
C109
0.1
R103
36K
TO
U. DRUM
CN1
VIDEO HEADS
(0)2.5
(0)2.5
(0)2.5
(0)2.5
CH1
CH2

S35301

4.19 PRE/REC CIRCUIT BOARD

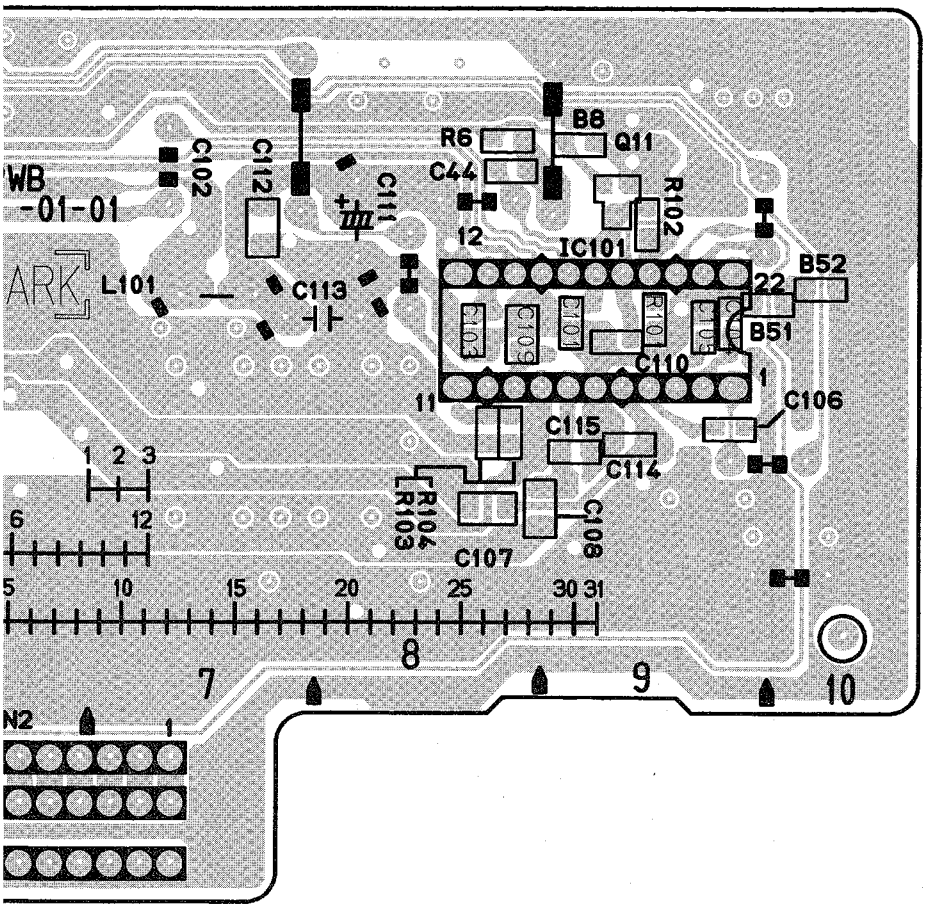


LEADLESS COMPONENT PARTS LOCATION GUIDE <PRE/REC PWB>

REF.No.	LOCATION
TRANSISTOR	
Q1	5C
Q2	2D
Q3	1C
Q4	2B
Q5	3C
Q6	3D
Q7	2D
Q8	2C
Q9	1B
Q10	2C
Q11	9D
Q12	3B
Q13	3B
Q14	1B
RESISTOR	
R1	5B
R2	5B
R4	5C
R5	5C
R6	8D
R12	4D
R13	2D
R14	2D
R15	2C
R16	2D
R17	2C
R18	1C
R19	1D
R20	2C
R21	2C
R22	1C
R23	1C
R24	1B
R26	3B
R27	3B
R31	3D
R32	3C
R33	3D
R34	3D
R35	3C
R37	3B
R101	9C
R102	9D
R103	8B
R104	8B

REF.No.	LOCATION
CAPACITOR	
C1	5C
C2	5D
C5	2C
C7	4D
C8	3C
C9	2D
C10	1D
C11	1D
C12	2C
C13	1C
C14	1C
C15	2B
C32	4C
C33	3D
C34	3C
C35	3C
C36	3C
C37	2C
C38	2D
C39	2D
C40	2C
C41	1B
C42	3C
C43	2D
C44	8D
C101	9C
C103	8C
C104	9C
C105	9C
C106	9C
C107	8B
C108	8B
C109	8C
C110	9C
C112	7D
C114	9C
C115	9C

REF.No.	LOCATION
IC10	
TR	
Q1	
Q2	
Q3	
Q4	
CC	
CN1	
CN2	
CN3	
TE	
TP6	
TP1	

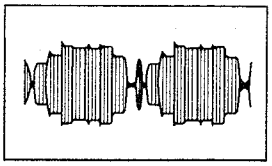


MAIN COMPONENT PARTS LOCATION GUIDE

ON	REF.No.	LOCATION
	IC	
	IC101	9C
	TRANSISTOR	
	Q1	5C
	Q2	2D
	Q3	1C
	Q4	2B
	CONNECTOR	
	CN1	6C
	CN2	6A
	CN3	4A
	TEST POINT	
	TP6	2D
	TP11	3D

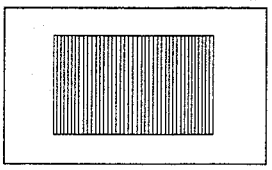
WAVEFORMS
— PRE/REC —

CN2-10
WF1 REC COLOR



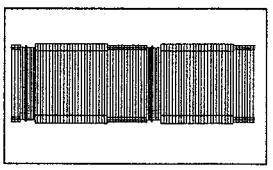
REC0.28Vp-p
10mV/20μsec/DIV

CN2-11
WF2 REC FM



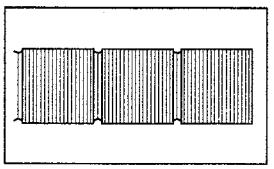
REC0.76Vp-p
20mV/5msec/DIV

WF3 IC101-16



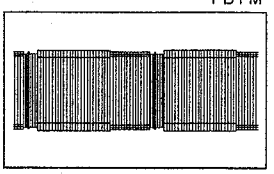
REC0.28Vp-p
10mV/5msec/DIV

WF4 IC101-8



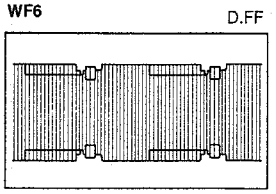
REC2.3Vp-p
50mV/5msec/DIV

TP6
WF5 PB FM



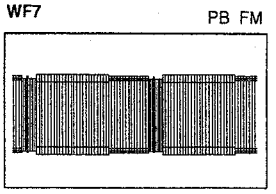
PB0.34Vp-p
10mV/5msec/DIV

TP11
WF6 D.FF



REC/PB5.0Vp-p
0.2V/10msec/DIV

CN3-2
WF7 PB FM



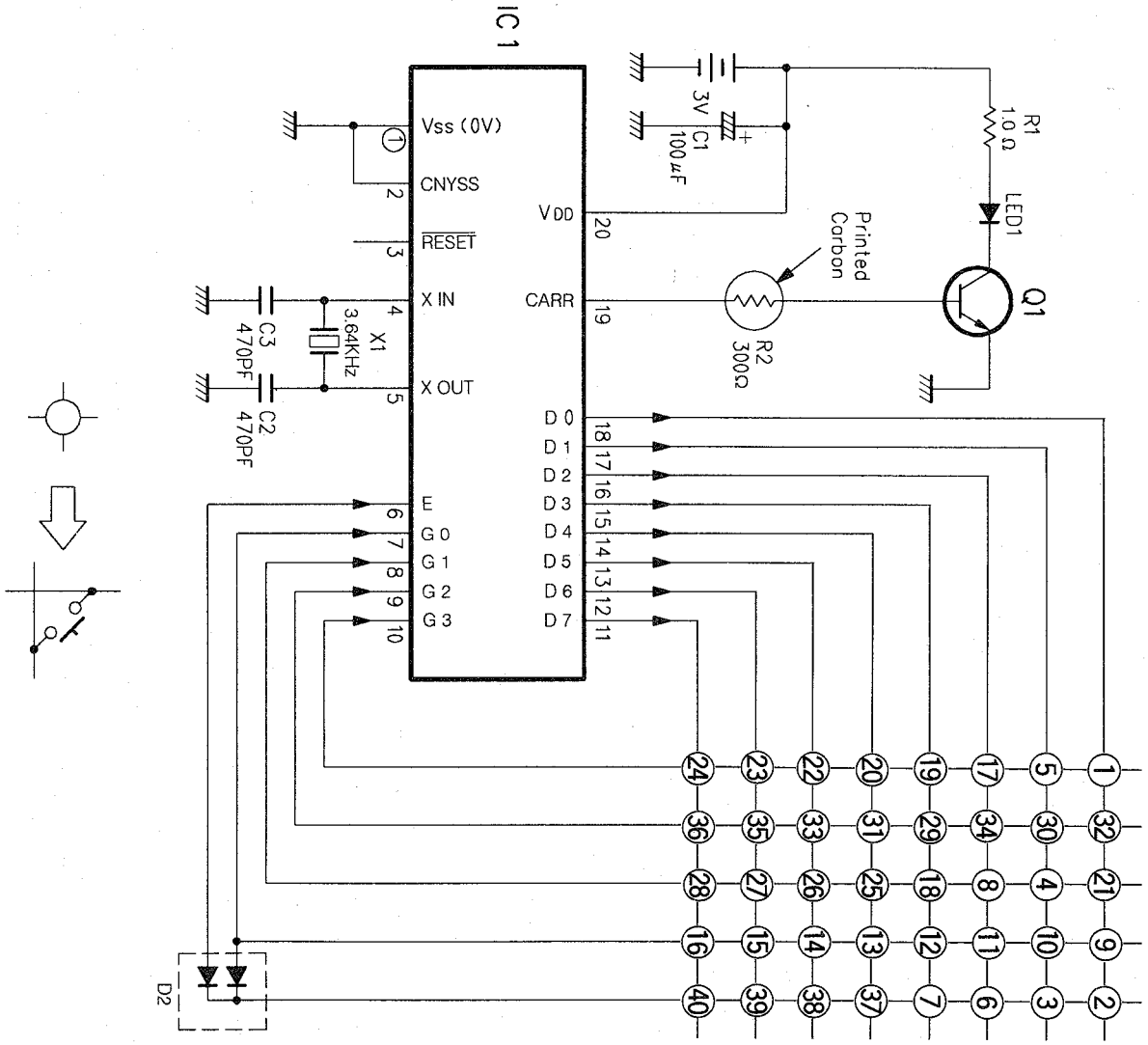
PB0.4Vp-p
20mV/5msec/DIV

4.20 REMOTE CONTROL SCHEMATIC DIAGRAM

– HR-J220E/J221E –

NOTE:
1. All parts shown in this schematic are critical for safety
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.

Key NO.	KEY NAME
1	TV / VIDEO
2	(TV/VIDEO)
3	(AUDIO)
4	POWER
5	DISPLAY
6	(TRACKING +)
7	(TRACKING -)
8	A.MONITOR
9	1
10	2
11	3
12	4
13	5
14	6
15	7
16	8
17	9
18	···/···(SP/LP)
19	0
20	TIMER
21	TV
22	CANCEL/C.RESET
23	SELECT/C.MEMORY
24	PROG/CLOCK
25	VOL.+
26	VOL.-
27	TV PROG / SET +
28	TV PROG /SET -
29	REW
30	PLAY
31	FF
32	REC
33	STOP
34	PAUSE
35	SHUTTLE PLUS ≪
36	SHUTTLE PLUS ≫
37	(TV CH+)
38	(TV CH−)
39	(TV POWER)
40	(TV VIDEO)

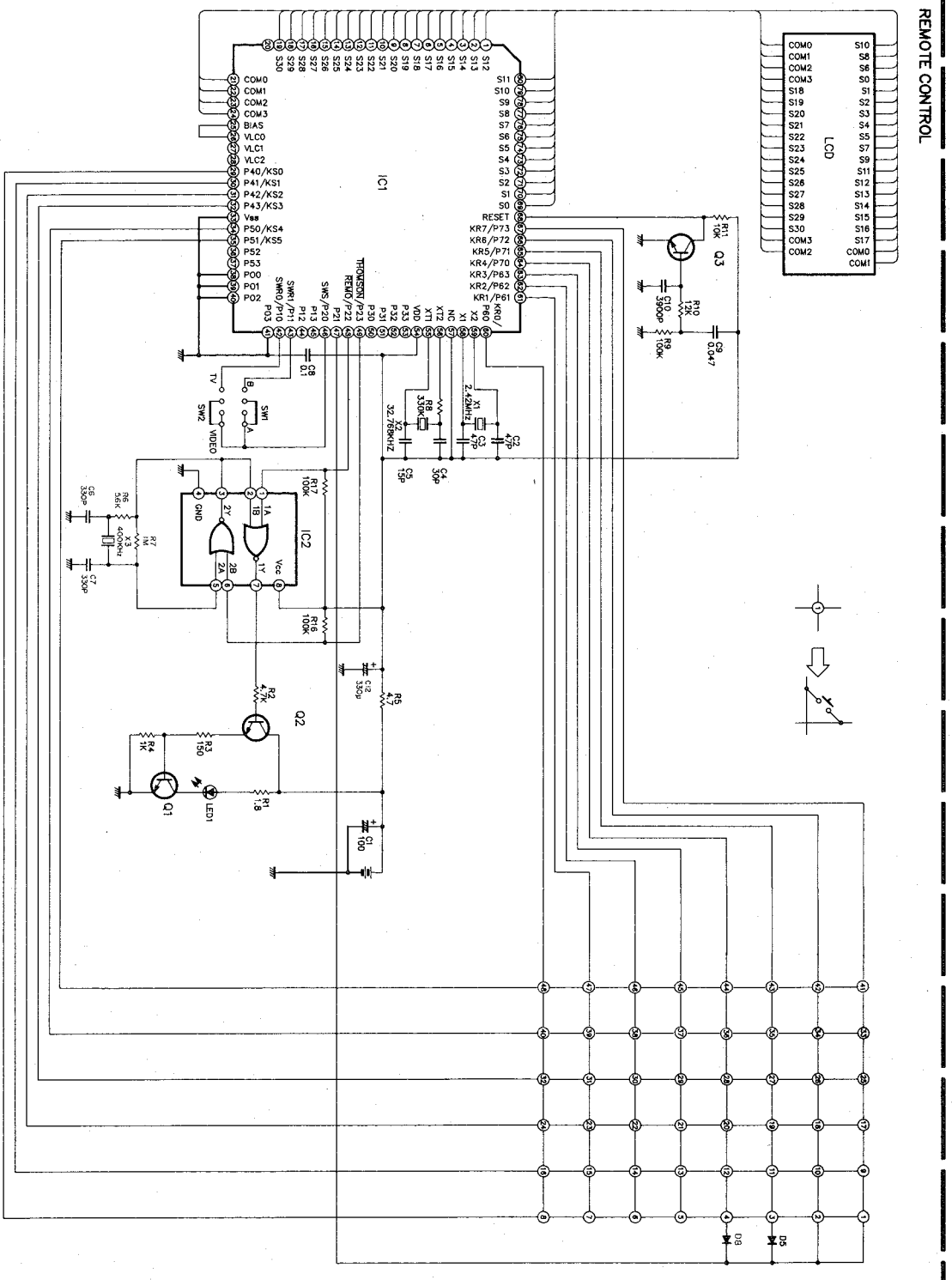


or safety.

NOTE:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.

—HR-E226EG—

REMOTE CONTROL



Key No.	FUNCTION NAME
1	RE-VIEW
2	OPERATE
3	TV/VIDEO
4	1
5	2
6	3
7	4 /ADD TIME
8	5 /SELECT/C.MEMO.
9	6 TIMER
10	TRANS
11	PLAY
12	REW
13	REC
14	FF
15	STOP
16	4
17	7/VPS
18	8/DAILY
19	CANCEL/C.RESET
20	0/AUX
21	ADJUST
22	9/WEEKLY
23	PROG./CLOCK/CH
24	PAUSE
25	TV PROG.+
26	TV PROG.−
27	VOL.−
28	A.MONITOR/MUTE
29	SP/LP −/−−
30	VOL.+
31	DISPLAY
32	SEARCH <<+10
33	SEARCH >>+20
34	REC START
#4-12	REC PAUSE
#4-13	

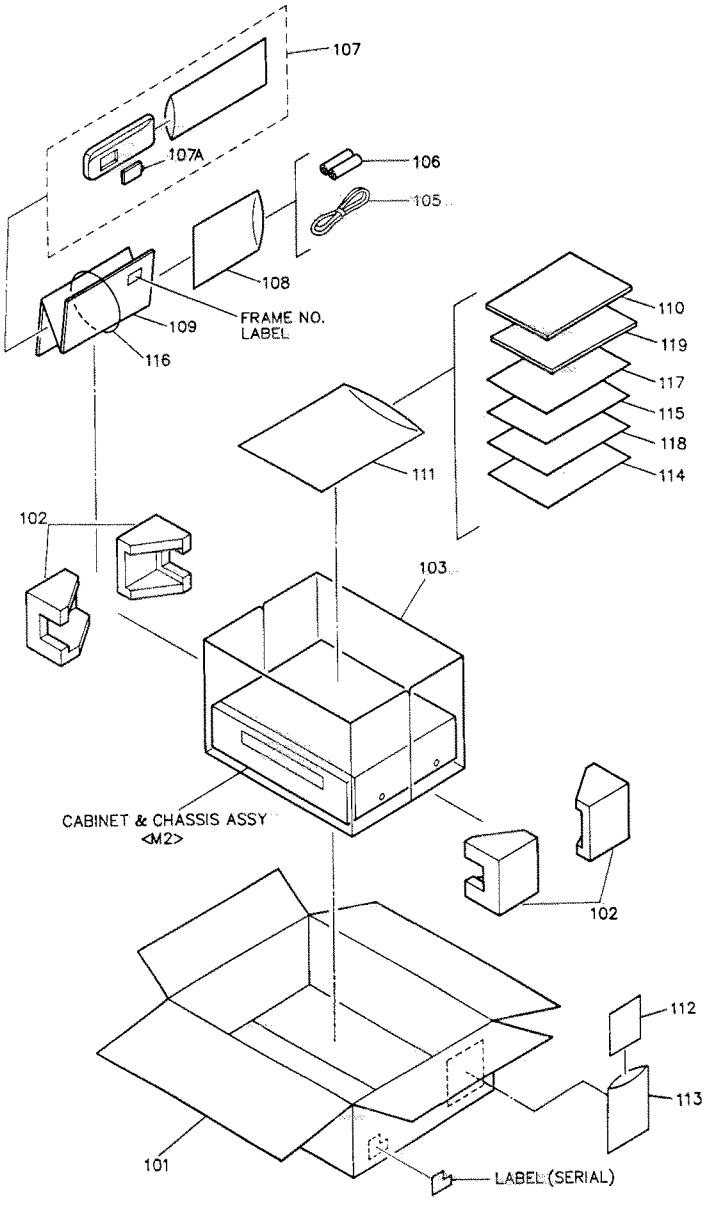
Key | KEY NAME

SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>



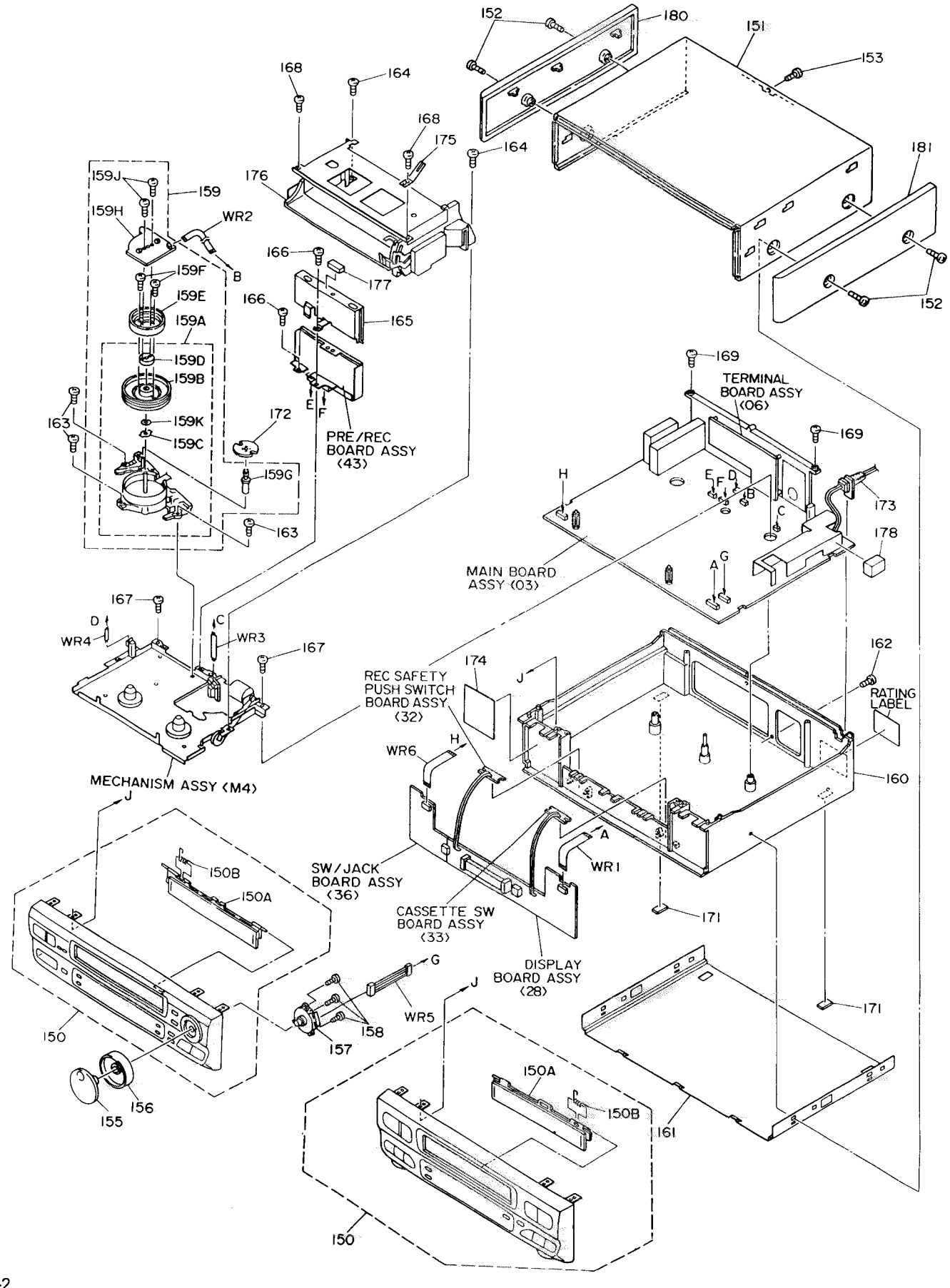
#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
			**********
			PACKING AND ACCESSORY ASSEMBLY <M1>
	101	PQ35336-17	PACKING CASE,J220E
		PQ35336-19	PACKING CASE,J221E
		PQ35361-1-1	PACKING CASE,E226EG
	102	PQ35331A	CUSHION ASSEMBLY,J220E J221E
		PQ35362A-1	CUSHION ASSEMBLY,E220EG
	103	PQM30021-93	POLY(FOAM)BAG
⚠	105	PEAC0300-02	RF CABLE
	106	PECA0786	BATTERY,X2 J220E J221E
		R6PRPA-2ST	BATTERY,X2 E226EG
⚠	107	PQ11534U-18	REMOTE CONTROLLER,E226EG
⚠		PQ21760D-3	REMOTE CONTROLLER,J220E J221E
	107A	PQ46063-2	CAP(BATTERY),E226EG

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	108	PQ35364	POLY BAG
	109	PQ35274-1-1	SHEET,ACCESSORY
⚠	110	PU30425-1596	INSTRUCTIONS,E226EG
⚠		PU30425-1606	INSTRUCTIONS,J220E
⚠		PU30425-1608	INSTRUCTIONS,J221E
	111	PQ35364-4	POLY BAG
	112	BT-20135	WARRANTY CARD,E226EG
	113	PQ33909	POLY BAG,E226EG
	114	PQ34978-15	SHEET(S.V.),E226EG
	115	PQ35231	SHEET(G.PROG.),E226EG
	116	PQ46504	RUBBER BAND
	117	PQ45146-78	SHEET(SPAIN),J220E J221E
	118	PQ45146-76	SHEET(SPAIN)
⚠	119	PU30425-1607	INSTRUCTIONS,J220E

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



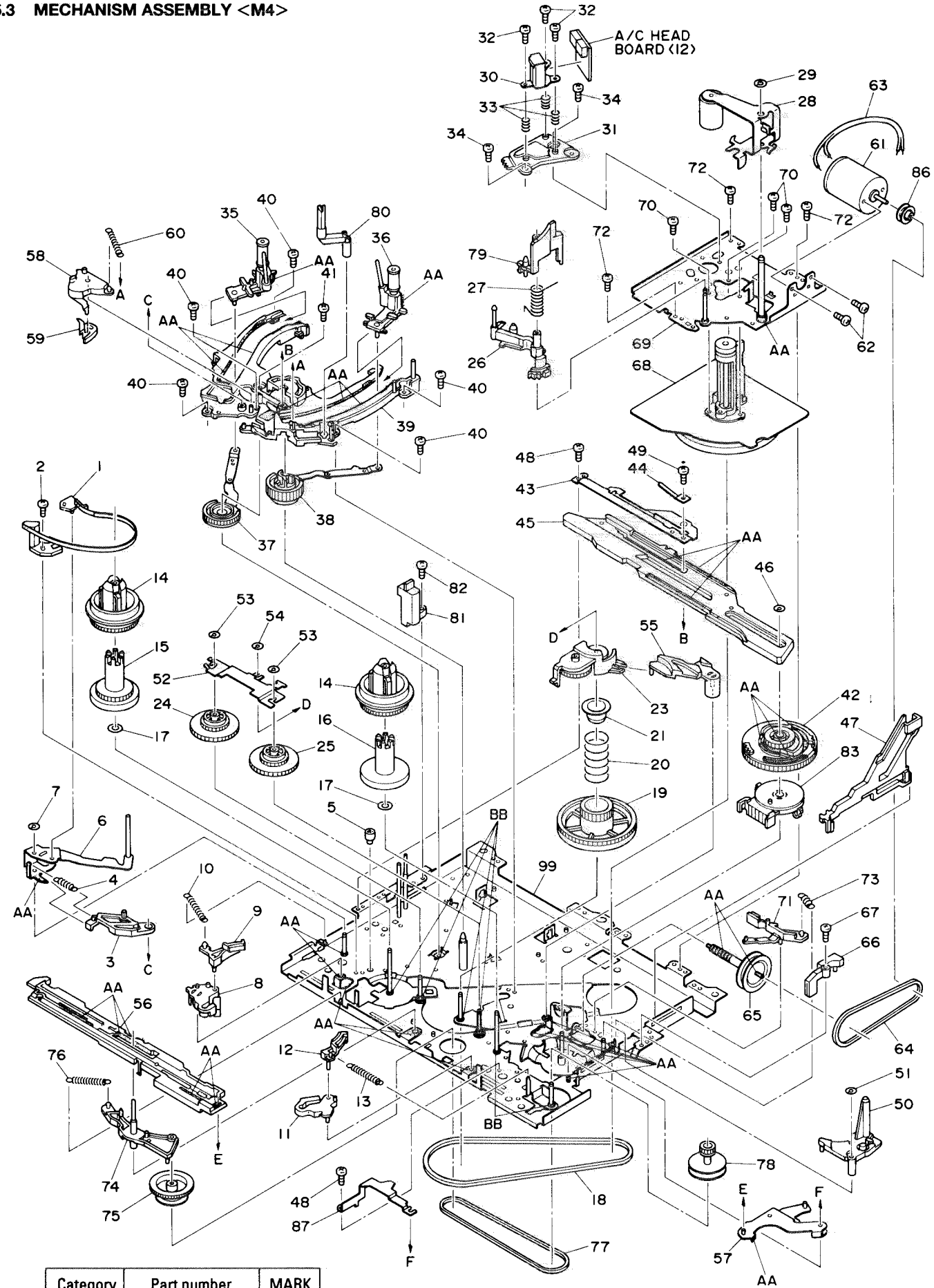
#⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

CABINET AND CHASSIS ASSEMBLY <M2>

	150	PQ11777L	FRONT PANEL ASSEMBLY,J220E
		PQ11777M	FRONT PANEL ASSEMBLY,J221E
		PQ11802A	FRONT PANEL ASSEMBLY,E226EG
	150A	PQ21778	CASSETTE DOOR,J220E J221E
		PQ21818	CASSETTE DOOR,E226EG
	150B	PQ46448	TORSION SPRING
⚠	151	PQ11676-7	TOP COVER,J220E J221E
⚠		PQ11676-9	TOP COVER,E226EG
	152	PQ43930	SPECIAL SCREW,X4 SIDE PANEL E226EG
		SDSF3010M	SCREW,X4 TOP COVER J220E J221E
	153	SDSF3010M	SCREW
	155	PQ35247-2	KNOB(JOG),E226EG
	156	PQ35295	KNOB(SHUTTLE),E226EG
	157	PEME0757-03	JOG SHUTTLE ASSEMBLY,E226EG
	158	SDSF2608Z	SCREW,X3 E226EG
	159	PDV2348A	DRUM ASSEMBLY
	159A	PDM2261H	DRUM SUB ASSEMBLY
	159B	PDM3353D-14	UPPER DRUM ASSEMBLY
	159C	PDM4400A	BRUSH ASSEMBLY
	159D	PDM4345A	COLLAR ASSEMBLY
	159E	PDZ0141-2	ROTOR ASSEMBLY
	159F	SPSH2660Z	SCREW,X2
	159G	PDM4311A-1	ROLLER ASSEMBLY
⚠	159H	PDZ0141-1-2	STATOR ASSEMBLY
	159J	SPSP2606Z	SCREW,X2
	159K	PDM4050-9	WASHER
⚠	160	PQ11666-3	BOTTOM CHASSIS,E226EG
⚠		PQ11666-1-9	BOTTOM CHASSIS,J220E J221E
⚠	161	PQ11668-2	BOTTOM COVER
	162	SDSF3010M	SCREW,BOTTOM COVER
	163	SPST2608Z	SCREW,X3 DRUM
	164	SPST2612Z	SCREW,X2 CASS HOUSING ASSY
	165	PQ21740-1-1	SHIELD CASE,PRE
	166	SDST2606Z	SCREW,X2 PRE
	167	SDSF4012Z	SCREW,X2 MECH
	168	SDSF3010Z	SCREW,X2 CASS HOUSING ASSY
	169	SDSF3010Z	SCREW,X2 TERMINAL
	171	PQ43013-3	FOOT,X2
	172	PQ45160	INERTIA PLATE
⚠	173	QMP4A10-170	POWER CORD
⚠	174	PQ46485	SPACER,SAFETY
	175	PQ41556	EARTH PLATE
	176	PUS29724B	CASSETTE HOUSING ASSEMBLY
	177	PQM30029-244	SPACER
	178	PQM30029-245	SPACER
	180	PQ11842	SIDE PANEL(L) E226EG
	181	PQ11843	SIDE PANEL(R) E226EG
	WR1	PW30802-1114	WIRE,DISP/SW
	WR2	PW30803-0414	WIRE,DRUM
	WR3	PW30101-C0HH887	WIRE,AUDIO CONTROL HEAD
	WR4	PW30101-P0HH882	WIRE, FE HEAD
	WR5	PW30218-0771613	WIRE,JOG E226EG
	WR6	PW30802-0914	WIRE,JACK E226EG

5.3 MECHANISM ASSEMBLY <M4>



Category	Part number	MARK
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION

****

MECHANISM ASSEMBLY <M4>

1	PQ46298A-3	TENSION BAND ASSEMBLY
2	SDST2608Z	SCREW
3	PQ35012	TENSION ARM LEVER
4	PQM30001-385	TENSION SPRING
5	PQ46302	ADJUST PIN
6	PQ46303A-1	TENSION ARM ASSEMBLY
7	PQM30017-47	SLIT WASHER
8	PQ46305B-3	MAIN BRAKE ASSEMBLY(SUPPLY)
9	PQ46306A-3	SUB BRAKE ASSEMBLY(SUPPLY)
10	PQM30001-393	TENSION SPRING
11	PQ46308A-2	MAIN BRAKE ASSEMBLY(TAKE UP)
12	PQ46309A-4	SUB BRAKE ASSEMBLY(TAKE UP)
13	PQM30001-389102	TENSION SPRING
14	PQ21683-1-3	REEL DISK,X2
15	PQ35014-1-3	SLIT DISK(SUPPLY)
16	PQ35015-1-1	SLIT DISK(TAKE UP)
17	PQM30018-69	SPECER,X2
18	PQM30003-33	BELT(CAPSTAN)
19	PQ46497B	PULLEY
20	PQM30002-233	COMPRESSION SPRING
21	PQ46311	SPRING CAP
22	PQM30018-69	SPACER
23	PQ46312B	IDLER ARM ASSEMNLY
24	PQ46316A-1	CLUTCH UNIT(SUPPLY)
25	PQ46323A-1	CLUTCH UNIT(TAKE UP)
26	PQ46325A-6	GUIDE ARM ASSEMBLY
27	PQ46326-1-2	TORSION SPRING
28	PQ46327A	PINCH ROLLER ARM ASSEMBLY
29	PQM30017-24	SLIT WASHER
30	PEHE0182	AUDIO/CONTROL HEAD
31	PQ35206	HEAD BASE
32	PQ43687A	SPECIAL SCREW,X3
33	PQM30002-192	COMPRESSION SPRING,X3
34	SDST2604Z	SCREW,X2
35	PQ46330A	POLE BASE ASSY(SUPPLY)
36	PQ46331A	POLE BASE ASSY(TAKE UP)
37	PQ46332A-2	LOADING ARM ASSY(SUPPLY)
38	PQ46337A-3	LOADING ARM ASSY(TAKE UP)
39	PQ11657-1-5	GUIDE RAIL
40	SPST2608Z	SCREW,X5
41	SDST2612Z	SCREW
42	PQ21684-1-3	CONTROL CAM

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
43	PQ35138-1-2	CONTROL BRACKET
44	PQ46423	EARTH PLATE
45	PQ11658-1-5	CONTROL PLATE
46	PQM30017-8	SLIT WASHER
47	PQ21685-2-6	PINCH PLATE
48	SPST2606Z	SCREW,X2
49	SPSF2608M	SCREW
50	PQ46342A-6	LEVER ASSY
51	PQM30017-8	SLIT WASHER
52	PQ35083-1-2	REEL BRACKET
53	PQM30017-51	SLIT WASHER,X2
54	Q03093-830	WASHER
55	PQ35026-1-2	IDLER LEVER
56	PQ11659-1-6	SLIDE PLATE
57	PQ46344A-2	CHANGE LEVER ASSEMBLY
58	PQ21686	TAKE UP LEVER ASSEMBLY
59	PQ46345	TAKE UP HEAD
60	PQM30001-387106	TENSION SPRING
⚠ 61	PU60628-3-2	MODE MOTOR
62	SPSP3003Z	SCREW,X2
63	PW30101-80AJ632	WIRE
64	PQM30003-34-17	BELT
65	PQ46395A	WORM GEAR ASSMBLY
66	PQ21699	WORM BEARING
67	SPST2606Z	SCREW
⚠ 68	PU61435	CAPSTAN MOTOR
69	PQ46347B-8	SUB DECK ASSEMBLY
70	SPSG2608Z	SCREW,X3
71	PQ46356A-1	CAPSTAN BRAKE ASSEMBLY
72	SPST2606Z	SCREW,X3
73	PQM30001-384101	TENSION SPRING,C.BRAKE
74	PQ46353A-1	CHANGE ARM ASSEMBLY
75	PQ46354	CHANGE GEAR
76	PQM30001-386	TENSION SPRING
77	PQM30003-35	BELT
78	PQ46355	CASSETTE GEAR
79	PQ35030	LID GUIDE
80	PQ21689	LED PRISM
81	PEHE0237	FULL ERASE HEAD
82	SDST2610Z	SCREW
83	PU61432-1-1	ROTARY ENCODER
86	PQ43546-1-2	MOTOR PULLEY
87	PQ35217-1-2	CONTROL BRACKET 2
99	PQ21680B-11	MAIN DECK ASSEMBLY

MAIN BOARD ASSEMBLY <03>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB10899T-01	MAIN BOARD ASSEMBLY,E226EG
		PB10899E-02	MAIN BOARD ASSEMBLY,J221E
		PB10899V-01	MAIN BOARD ASSEMBLY,J220E
⚠	TNR1	PERF0175	TUNER UNIT
⚠	TNR2	PERF0185	IF UNIT
	IC1	BA7797F-XE	IC
	IC2	BA7631	IC,J221E E226EG
	IC3	BA15218	IC,J221E E226EG
		or XRA15218	IC,J221E E226EG
	IC201	JCP0045B-1	IC
	IC202	TL8850P	IC
	IC301	BA7630S	IC,J221E E226EG
	IC401	BU2885S	IC
		or BU2884S	IC
	IC601	HD6433927B64F	QFP IC (MCU)
	IC602	93LC56B/P	IC
		or 93LC56/P	IC
		or XLJ93LC56A	IC
		or 93C56/P	IC
		or AT93C56-10PC	IC
	IC603	S-80728AN-Z	IC
		or RE5VA28A	IC
	IC604	TA7291S	IC
	IC607	M50253P	IC
		or BU2090	IC
	IC751	SAA4700	IC,E226EG
	Q1	2SA1576(QR)	TRANSISTOR
	Q2	2SA1576(QR)	TRANSISTOR
	Q3	2SC4081(QR)	TRANSISTOR
	Q202	2SC4081(QRS)	TRANSISTOR
	Q203	2SC4081(QRS)	TRANSISTOR
	Q204	2SC4081(QRS)	TRANSISTOR
	Q205	DTC144WU	TRANSISTOR
	Q206	2SA1576(QRS)	TRANSISTOR
	Q207	2SA1576(QRS)	TRANSISTOR
	Q208	2SA1576(QRS)	TRANSISTOR
	Q210	DTC144EU	TRANSISTOR
	Q212	DTA144EU	TRANSISTOR
	Q301	2SA1576(QRS)	TRANSISTOR,J221E E226EG
	Q302	2SA1576(QRS)	TRANSISTOR,J221E E226EG
	Q303	2SC4081(QRS)	TRANSISTOR,J221E E226EG
	Q501	2SA933S(RS)	TRANSISTOR
		or 2SA1267(YG)-TJK	TRANSISTOR
	Q502	2SA933S(RS)	TRANSISTOR,J221E E226EG
		or 2SA1267(YG)-TJK	TRANSISTOR,J221E E226EG
	Q503	DTC124EU	TRANSISTOR,J220E
	Q601	2SC4081(QRS)	TRANSISTOR
	Q602	DTC114WU	TRANSISTOR,J221E E226EG
	Q604	PN268VI	PHOTO TRANSISTOR
	Q605	PN268VI	PHOTO TRANSISTOR
	Q607	DTC143EU	TRANSISTOR
	Q608	DTC124EU	TRANSISTOR
	Q609	DTC124EU	TRANSISTOR
	Q611	DTC124EU	TRANSISTOR
	Q801	2SK2043-CB14	FE TRANSISTOR
		or 2SK1953-LF	FE TRANSISTOR
		or 2SK2324-LT	FE TRANSISTOR

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	Q802	2SC3616(ML)	TRANSISTOR
	Q851	2SD2166	TRANSISTOR
	Q852	2SC1740S	TRANSISTOR
	Q853	2SC3616(MLK)	TRANSISTOR
	Q854	DTA114EU	TRANSISTOR
	Q855	2SD2144S(UVW)	TRANSISTOR
	Q856	2SB1256	TRANSISTOR
	Q857	DTC114TU	TRANSISTOR
	Q858	2SC1740S(RS)	TRANSISTOR
		or 2SC3199(GB)-TJK	TRANSISTOR
	Q859	2SD1450S,T	TRANSISTOR
		or 2SD1302(ST)	TRANSISTOR
	Q901	DTC114EU	TRANSISTOR
	Q902	2SB810H,J	TRANSISTOR
	Q903	2SC3068	TRANSISTOR
	Q904	2SA1576(RS)	TRANSISTOR
	Q905	2SC4081(RS)	TRANSISTOR
	Q906	DTC114EU	TRANSISTOR
	Q909	DTA144EU	TRANSISTOR
	D1	1N4148M	DIODE,J220E E226EG
		or 1SS133	DIODE,J220E E226EG
		or MA165	DIODE,J220E E226EG
	D202	1N4148M	DIODE
		or 1SS133	DIODE
		or MA165	DIODE
	D203	1N4148M	DIODE
		or MA165	DIODE
		or 1SS133	DIODE
	D204	1N4148M	DIODE
		or 1SS133	DIODE
		or MA165	DIODE
	D205	1N4148M	DIODE
		or MA165	DIODE
		or 1SS133	DIODE
	D208	1N4148M	DIODE
		or 1SS133	DIODE
		or MA165	DIODE
	D209	1N4148M	DIODE
		or MA165	DIODE
		or 1SS133	DIODE
	D601	RD9.1ES-T1B2	ZENER DIODE
	D602	11ES2	DIODE
	D603	1N4148M	DIODE
		or 1SS133	DIODE
		or MA165	DIODE
	D604	11ES2	DIODE
	D605	1N4148M	DIODE
		or 1SS133	DIODE
		or MA165	DIODE
	D606	1N4148M	DIODE
		or MA165	DIODE
		or 1SS133	DIODE
	D607	1N4148M	DIODE
		or 1SS133	DIODE
		or MA165	DIODE
	D609	1N4148M	DIODE
		or 1SS133	DIODE
		or MA165	DIODE
	D610	SIR-381SB3FM	LE DIODE
		or SIR-381SB3FX1M	LE DIODE

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
D612	1N4148M	DIODE,E226EG
	or MA165	DIODE,E226EG
	or 1SS133	DIODE,E226EG
D613	1N4148M	DIODE,E226EG
	or 1SS133	DIODE,E226EG
	or MA165	DIODE,E226EG
D801	10E6-F2	DIODE
D802	10E6-F2	DIODE
D803	10E6-F2	DIODE
D804	10E6-F2	DIODE
D807	1SS133	DIODE
	or MA165	DIODE
	or 1N4148M	DIODE
D808	1SS133	DIODE
	or 1N4148M	DIODE
	or MA165	DIODE
D809	UZ27BSB	ZENER DIODE
	or MTZ27BT-77	ZENER DIODE
	or RD27ES-T1B2	DIODE
D810	AU01	FR DIODE
	or ERA18-04-T2	FR DIODE
	or 1SR153-400-T2	FR DIODE
	or 10ELS4	FR DIODE
D811	AU01	FR DIODE
	or ERA18-04-T2	FR DIODE
	or 1SR153-400-T2	FR DIODE
	or 10ELS4	FR DIODE
D851	AU01Z	FR DIODE
	or ERA18-02-T2	FR DIODE
	or 1SR153-200-T2	FR DIODE
	or 10ELS2	FR DIODE
D852	RL2Z-LFB2	FR DIODE
D853	RL2Z-LFB2	FR DIODE
D854	RK14LF-B2	BARRIER DIODE
	or 21DQ04	BARRIER DIODE
D855	RD15ES-T1B1	ZENER DIODE
	or UZ15BSA	DIODE
D856	RD6.2ES-T1B3	ZENER DIODE
	or UZ6.2BSC	ZENER DIODE
	or MTZV6.2C	ZENER DIODE
D858	HZ27BP	ZENER DIODE
D859	HZ30CP	ZENER DIODE
D862	RD5.1JSB2	DIODE
D863	1SS133	DIODE
	or 1N4148M	DIODE
	or MA165	DIODE
D864	11ES2	DIODE
D865	1SS131Y	DIODE
D866	1SS131Y	DIODE
D867	1SS131Y	DIODE
D868	1SS131Y	DIODE
D869	1SS133	DIODE
	or 1N4148M	DIODE
	or MA165	DIODE
D870	1SS133	DIODE
	or MA165	DIODE
	or 1N4148M	DIODE
D877	MTZ12A	ZENER DIODE,J221E E226EG
D901	MTZ10D	ZENER DIODE
D903	1SS133	DIODE
	or 1N4148M	DIODE
	or MA165	DIODE

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
D904	1SS133	DIODE	
	or MA165	DIODE	
	or 1N4148M	DIODE	
D905	1SS133	DIODE	
	or 1N4148M	DIODE	
	or MA165	DIODE	
R1	QRSA08J-151YN	RESISTOR	150Ω,1/10W
R2	QRSA08J-274YN	RESISTOR	270kΩ,1/10W
R4	QRD161J-475	RESISTOR	4.7MΩ,1/6W
R5	QRD161J-473	RESISTOR,E226EG	47kΩ,1/6W
R6	QRSA08J-183YN	RESISTOR,E226EG	18kΩ,1/10W
R7	QRD161J-473	RESISTOR	47kΩ,1/6W
R8	QRSA08J-183YN	RESISTOR	18kΩ,1/10W
R9	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R10	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R11	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R12	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
R13	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
R14	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
R15	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
R16	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
R17	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
R18	QRSA08J-3R3YN	RESISTOR	3.3Ω,1/10W
R19	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
R20	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
R21	QRSA08J-473YN	RESISTOR	47kΩ,1/10W
R22	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
R23	QRSA08J-473YN	RESISTOR	47kΩ,1/10W
R24	QRSA08J-183YN	RESISTOR	18kΩ,1/10W
R25	QRD161J-820	RESISTOR	82Ω,1/6W
R31	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R32	QRSA08J-822YN	RESISTOR	8.2kΩ,1/10W
R36	QRSA08J-221YN	RESISTOR	220Ω,1/10W
R37	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R38	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
R39	QRSA08J-123YN	RESISTOR,J220E E226EG	12kΩ,1/10W
R40	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
R41	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
R42	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
R47	QRSA08J-103YN	RESISTOR,J221E E226EG	10kΩ,1/10W
R48	QRSA08J-103YN	RESISTOR,J221E E226EG	10kΩ,1/10W
R49	QRSA08J-103YN	RESISTOR,J221E E226EG	10kΩ,1/10W
R50	QRSA08J-103YN	RESISTOR,J221E E226EG	10kΩ,1/10W
R51	QRSA08J-333YN	RESISTOR,J221E E226EG	33kΩ,1/10W
R52	QRSA08J-103YN	RESISTOR,J221E E226EG	10kΩ,1/10W
R57	QRSA08J-473YN	RESISTOR,J221E E226EG	47kΩ,1/10W
R58	QRSA08J-473YN	RESISTOR,J221E E226EG	47kΩ,1/10W
R59	QRSA08J-224YN	RESISTOR,J221E E226EG	220kΩ,1/10W
R201	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
R202	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
R205	QRSA08J-475YN	RESISTOR	4.7MΩ,1/10W
R206	QRSA08J-475YN	RESISTOR	4.7MΩ,1/10W
R208	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R209	QRSA08J-391YN	RESISTOR	390Ω,1/10W
R210	QRSA08J-512YN	RESISTOR	5.1kΩ,1/10W
R211	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
R212	QRSA08J-331YN	RESISTOR	330Ω,1/10W
R213	QRSA08J-621YN	RESISTOR	620Ω,1/10W
R214	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
R215	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
R216	QRSA08J-331YN	RESISTOR	330Ω,1/10W
R217	QRSA08J-103YN	RESISTOR	10kΩ,1/10W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R218	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R219	QRSA08J-822YN	RESISTOR	8.2kΩ,1/10W
R220	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
R221	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
R222	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
R223	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R224	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
R229	QRSA08J-561YN	RESISTOR	560Ω,1/10W
R230	QRSA08J-681YN	RESISTOR	680Ω,1/10W
R231	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
R232	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
R233	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
R234	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
R235	QRSA08J-821YN	RESISTOR	820Ω,1/10W
R236	QRD123J-331S	RESISTOR,J221E E226EG	330Ω,1/2W
	QRD123J-391S	RESISTOR,J220E	390Ω,1/2W
R237	QRSA08J-750YN	RESISTOR	75Ω,1/10W
R238	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
R239	QRD161J-102	RESISTOR	1kΩ,1/6W
R240	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R241	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R245	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
R247	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
R248	QRSA08J-683YN	RESISTOR	68kΩ,1/10W
R249	QRSA08J-561YN	RESISTOR	560Ω,1/10W
R251	QRSA08J-823YN	RESISTOR	82kΩ,1/10W
R252	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R253	QRSA08J-824YN	RESISTOR	820kΩ,1/10W
R254	QRSA08J-185YN	RESISTOR	1.8MΩ,1/10W
R255	QRD161J-273	RESISTOR	27kΩ,1/6W
R301	QRSA08J-335YN	RESISTOR,J221E E226EG	3.3MΩ,1/10W
R302	QRD123J-331S	RESISTOR,J221E E226EG	330Ω,1/2W
R304	QRSA08J-102YN	RESISTOR,J221E E226EG	1kΩ,1/10W
R305	QRSA08J-102YN	RESISTOR,J221E E226EG	1kΩ,1/10W
R306	QRSA08J-222YN	RESISTOR,J221E E226EG	2.2kΩ,1/10W
R402	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
R403	QRD161J-102	RESISTOR	1kΩ,1/6W
R404	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R405	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R406	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R407	QRSA08J-242YN	RESISTOR	2.4kΩ,1/10W
R408	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
R409	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R410	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R411	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R412	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R415	QRD161J-222	RESISTOR	2.2kΩ,1/6W
R501	QRD123J-331S	RESISTOR	330Ω,1/2W
R502	QRD161J-393	RESISTOR	39kΩ,1/6W
R503	QRD161J-102	RESISTOR	1kΩ,1/6W
R504	QRSA08J-102YN	RESISTOR,J221E E226EG	1kΩ,1/10W
R506	QRSA08J-750YN	RESISTOR	75Ω,1/10W
R511	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
R512	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
R601	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R602	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R603	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R604	QRD161J-472	RESISTOR	4.7kΩ,1/6W
R605	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R606	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R607	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R608	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
R609	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R610	QRD161J-472	RESISTOR	4.7kΩ,1/6W
R611	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R612	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R613	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R614	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R615	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R616	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R617	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R618	QRD161J-332	RESISTOR	3.3kΩ,1/6W
R619	QRD161J-332	RESISTOR	3.3kΩ,1/6W
R620	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R621	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R622	QRSA08J-271YN	RESISTOR	270Ω,1/10W
R623	QRD161J-472	RESISTOR	4.7kΩ,1/6W
R624	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R625	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
R626	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R627	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R628	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R629	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R630	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R631	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R632	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R633	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R634	QRD161J-102	RESISTOR	1kΩ,1/6W
R635	QRSA08J-102YN	RESISTOR,J221E E226EG	1kΩ,1/10W
R636	QRSA08J-271YN	RESISTOR	270Ω,1/10W
R637	QRSA08J-271YN	RESISTOR	270Ω,1/10W
R638	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R639	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R640	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R641	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R642	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R643	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R644	QRD161J-152	RESISTOR	1.5kΩ,1/6W
R645	QRD161J-472	RESISTOR	4.7kΩ,1/6W
R647	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R648	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R649	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R650	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R651	QRD161J-472	RESISTOR	4.7kΩ,1/6W
R654	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R655	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R656	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R657	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R658	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R660	QRSA08J-0R0Y	RESISTOR,E226EG	0Ω,1/10W
R662	QRSA08J-681YN	RESISTOR	680Ω,1/10W
R663	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
R665	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R666	QRSA08J-473YN	RESISTOR	47kΩ,1/10W
R667	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
R669	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R670	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
R671	QRD161J-104	RESISTOR	100kΩ,1/6W
R672	QRSA08J-151YN	RESISTOR	150Ω,1/10W
R674	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
R675	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R676	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R677	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R678	QRSA08J-103YN	RESISTOR	10kΩ,1/10W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R679	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R680	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R681	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R682	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R685	QRSA08J-221YN	RESISTOR	220Ω,1/10W
R686	QRSA08J-750YN	RESISTOR	75Ω,1/10W
R687	QRSA08J-221YN	RESISTOR	220Ω,1/10W
R688	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
R689	QRD161J-153	RESISTOR	15kΩ,1/6W
R690	QRD161J-103	RESISTOR	10kΩ,1/6W
R691	QRD161J-102	RESISTOR	1kΩ,1/6W
R693	QRSA08J-681YN	RESISTOR,J221E E226EG	680Ω,1/10W
R696	QRSA08J-471YN	RESISTOR	470Ω,1/10W
R697	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
R699	QRD161J-104	RESISTOR	100kΩ,1/6W
R700	QRSA08J-471YN	RESISTOR	470Ω,1/10W
R701	QRSA08J-101YN	RESISTOR	100Ω,1/10W
R702	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R703	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R704	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R705	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R706	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R707	QRSA08J-103YN	RESISTOR,J220E J221E	10kΩ,1/10W
R708	QRD161J-103	RESISTOR	10kΩ,1/6W
R751	QRSA08J-822YN	RESISTOR,E226EG	8.2kΩ,1/10W
R752	QRSA08J-753YN	RESISTOR,E226EG	75kΩ,1/10W
R753	QRSA08J-472YN	RESISTOR,E226EG	4.7kΩ,1/10W
R801	QRD161J-334	RESISTOR	330kΩ,1/6W
R802	QRD161J-334	RESISTOR	330kΩ,1/6W
R803	QRD161J-683	RESISTOR	68kΩ,1/6W
R804	QRG029J-331A	OMF RESISTOR	330Ω,2W
R805	QRX014J-R39Z	MF RESISTOR	0.39Ω,1W
R806	QRD161J-821	RESISTOR	820Ω,1/6W
R807	QRD161J-122	RESISTOR	1.2kΩ,1/6W
R808	QRG029J-683G	OMF RESISTOR	68kΩ,2W
R851	QRD161J-102	RESISTOR	1kΩ,1/6W
R852	QRV144F-3740AY	CMF RESISTOR	374Ω,1/4W
R853	QRV144F-4870AY	CMF RESISTOR	487Ω,1/4W
R854	QRD161J-122	RESISTOR	1.2kΩ,1/6W
R855	QRG02DJ-471X	OMF RESISTOR	470Ω,2W
R857	QRG02DJ-681X	OMF RESISTOR	680Ω,2W
R858	QRD161J-471	RESISTOR	470Ω,1/6W
R859	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
R860	QRSA08J-471YN	RESISTOR	470Ω,1/10W
R861	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R863	QRD161J-511	RESISTOR	510Ω,1/6W
R864	QRD161J-471	RESISTOR	470Ω,1/6W
R865	QRSA08J-471YN	RESISTOR	470Ω,1/10W
R866	QRSA08J-473YN	RESISTOR	47kΩ,1/10W
R867	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
R868	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
R870	QRG01DJ-150X	MF RESISTOR	15Ω,1W
R872	QRSA08J-101YN	RESISTOR,J220E	100Ω,1/10W
	QRSA08J-221YN	RESISTOR,J221E E226EG	220Ω,1/10W
R873	QRD161J-562	RESISTOR	5.6kΩ,1/6W
R874	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
R875	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
R878	QRD161J-101	RESISTOR,J221E E226EG	100Ω,1/6W
R901	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
R902	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
R903	QRSA08J-331YN	RESISTOR	330Ω,1/10W
R904	QRSA08J-101YN	RESISTOR	100Ω,1/10W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R905	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R906	QRD161J-272	RESISTOR	2.7kΩ,1/6W
R907	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
R908	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
R909	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R910	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
C1	QETF1AM-226	E CAPACITOR	22μF,10V
C2	QCYA1HK-123	CAPACITOR	0.012μF,50V
C3	QCYA1HK-273	CAPACITOR	0.027μF,50V
C4	QETC1AM-226	E CAPACITOR	22μF,10V
C5	QCYA1HK-273	CAPACITOR,J220E E226EG	0.027μF,50V
C6	QCYA1HK-273	CAPACITOR	0.027μF,50V
C7	QETC1CM-106	E CAPACITOR	10μF,16V
C8	QETF1CM-106	E CAPACITOR	10μF,16V
C9	QETF1CM-476	E CAPACITOR	47μF,16V
C10	QCC11EJ-182	CAPACITOR	0.0018μF,25V
C11	QCC11EJ-472	CAPACITOR	0.0047μF,25V
C12	QETF1HM-105	E CAPACITOR	1μF,50V
C13	QCYA1HK-681	CAPACITOR	680pF,50V
C14	QEK61EM-475	E CAPACITOR	4.7μF,25V
C15	QCYA1HK-223	CAPACITOR	0.022μF,50V
C16	QCYA1HK-472	CAPACITOR	0.0047μF,50V
C17	QEKF1CM-106	E CAPACITOR	10μF,16V
C18	QFN31HJ-823	F CAPACITOR	0.082μF,50V
C19	QCYA1HK-331	CAPACITOR	330pF,50V
C25	QETC1AM-476	E CAPACITOR,J221E E226EG	47μF,10V
C26	QETC1CM-106	E CAPACITOR,J221E E226EG	10μF,16V
C27	QETC1CM-106	E CAPACITOR,J221E E226EG	10μF,16V
C28	QETC1CM-106	E CAPACITOR,J221E E226EG	10μF,16V
C29	QETC1CM-106	E CAPACITOR,J221E E226EG	10μF,16V
C30	QETC1AM-476	E CAPACITOR,J221E E226EG	47μF,10V
C31	QETC1AM-476	E CAPACITOR,J221E E226EG	47μF,10V
C35	QETF1CM-106	E CAPACITOR,J221E E226EG	10μF,16V
C36	QCYA1HK-223	CAPACITOR,J221E E226EG	0.022μF,50V
C37	QCYA1HK-681	CAPACITOR	680pF,50V
C201	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C202	QCSA1HJ-330	CAPACITOR	33pF,50V
C203	QCFA1CZ-474	CAPACITOR	0.47μF,16V
C204	QCFA1CZ-474	CAPACITOR	0.47μF,16V
C205	QCFA1CZ-105	CAPACITOR	1μF,16V
C206	QEKF1EM-475	E CAPACITOR	4.7μF,25V
C207	QEKF1EM-475	E CAPACITOR	4.7μF,25V
C209	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C210	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C211	QCSA1HJ-221	CAPACITOR	220pF,50V
C213	QCSA1HG-821	CAPACITOR	820pF,50V
C215	QCSA1HJ-181	CAPACITOR	180pF,50V
C216	QEKF1AM-226	E CAPACITOR	22μF,10V
C218	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C219	QCSA1HJ-220	CAPACITOR	22pF,50V
C221	QCSA1HJ-680	CAPACITOR	68pF,50V
C222	QCSA1HJ-181	CAPACITOR	180pF,50V
C223	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C224	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C225	QCSA1HJ-100	CAPACITOR	10pF,50V
C226	QEKF1HM-225	E CAPACITOR	2.2μF,50V
C227	QCYA1EK-223	CAPACITOR	0.022μF,25V
C228	QEKF1EM-475	E CAPACITOR	4.7μF,25V
C229	QCYA1HK-222	CAPACITOR	0.0022μF,50V
C230	QEKF1HM-105	E CAPACITOR	1μF,50V
C231	QCTA1CH-680	CAPACITOR	68pF,16V
C232	QCYA1EK-104	CAPACITOR	0.1μF,25V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C233	QCSA1HJ-560	CAPACITOR	56pF,50V
C234	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C235	QEPF1HM-474	NP E CAPACITOR	0.47μF,50V
C236	QEKF1EM-475	E CAPACITOR	4.7μF,25V
C237	QEKF1EM-475	E CAPACITOR,J220E	4.7μF,25V
C238	QCFA1CZ-474	CAPACITOR	0.47μF,16V
C239	QEKF1EM-475	E CAPACITOR,E226EG	4.7μF,25V
C240	QCYA1HK-333	CAPACITOR	0.033μF,50V
C241	QCVB1CN-103	CAPACITOR	0.01μF,16V
C242	QCSA1HJ-750	CAPACITOR	75pF,50V
C243	QCYA1EK-104	CAPACITOR	0.1μF,25V
C244	QCSA1HJ-681	CAPACITOR	680pF,50V
C245	QCYA1HK-103	CAPACITOR	0.01μF,50V
C246	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C247	QCVB1CN-103	CAPACITOR	0.01μF,16V
C248	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C249	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C250	QCYA1EK-473	CAPACITOR	0.047μF,25V
C251	QEKF1HM-105	E CAPACITOR	1μF,50V
C252	QEKF1HM-105	E CAPACITOR	1μF,50V
C253	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C257	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C258	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C259	QEKF1HM-105	E CAPACITOR	1μF,50V
C260	QCFA1CZ-474	CAPACITOR	0.47μF,16V
C261	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C262	QEKF1CM-106	E CAPACITOR	10μF,16V
C263	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C264	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C265	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C266	QCYA1HK-472	CAPACITOR	0.0047μF,50V
C267	QETC0JM-477	E CAPACITOR	470μF,6.3V
C269	QCFA1HZ-103	CAPACITOR,J221E E226EG	0.01μF,50V
	QCYA1HK-103	CAPACITOR,J220E	0.01μF,50V
C270	QETA1CM-337	E CAPACITOR,J221E E226EG	330μF,16V
	QETC1CM-107	E CAPACITOR,J220E	100μF,16V
C272	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C273	QEKF0JM-107	E CAPACITOR	100μF,6.3V
C274	QEKF0JM-227	E CAPACITOR,J221E E226EG	220μF,6.3V
	QEKF0JM-107	E CAPACITOR,J220E	100μF,6.3V
C276	QCSA1HJ-220	CAPACITOR	22pF,50V
C277	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C278	QCFA1HZ-103	CAPACITOR	0.01μF,50V
C279	QCSA1HJ-470	CAPACITOR	47pF,50V
C281	QCSA1HJ-120	CAPACITOR	12pF,50V
C301	QETF1HM-474	E CAPACITOR,J221E E226EG	0.47μF,50V
C302	QCYA1EK-104	CAPACITOR,J221E E226EG	0.1μF,25V
C303	QETF0JM-476	E CAPACITOR,J221E E226EG	47μF,6.3V
C304	QEPF1HM-474	NP E CAPACITOR,J221E E226EG	0.47μF,50V
C305	QEPF1HM-105	NP E CAPACITOR,J221E E226EG	1μF,50V
C306	QETF1HM-105	E CAPACITOR,J221E E226EG	1μF,50V
C307	QETC0JM-477	E CAPACITOR,J221E E226EG	470μF,6.3V
C401	QCYA1HK-102	CAPACITOR	0.001μF,50V
C403	QCYA1HK-102	CAPACITOR	0.001μF,50V
C404	QCYA1EK-563	CAPACITOR	0.056μF,25V
C405	QCYA1HK-102	CAPACITOR	0.001μF,50V
C406	QCYA1HK-103	CAPACITOR	0.01μF,50V
C407	QEKF1CM-106	E CAPACITOR	10μF,16V
C408	QEKF1CM-106	E CAPACITOR	10μF,16V
C409	QEKF0JM-107	E CAPACITOR	100μF,6.3V
C410	QCFB1HZ-104	CAPACITOR	0.1μF,50V
C413	QEKF1HM-105	E CAPACITOR	1μF,50V

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C414	QCSA1HJ-270	CAPACITOR	27pF,50V
C415	QCYA1EK-123	CAPACITOR	0.012μF,25V
C418	QCSA1HJ-181	CAPACITOR	180pF,50V
C501	QCYA1HK-471	CAPACITOR	470pF,50V
C502	QCYA1HK-471	CAPACITOR	470pF,50V
C503	QCYA1HK-102	CAPACITOR	0.001μF,50V
C507	QCSB1HJ-680	CAPACITOR,J221E E226EG	68pF,50V
	QCSB1HJ-330	CAPACITOR,J220E	33pF,50V
C601	QAT3120-450Z	TRIM CAPACITOR,TIMER CLOCK	
C602	QCTA1CH-180	CAPACITOR	18pF,16V
C603	QCYA1HK-103	CAPACITOR	0.01μF,50V
C604	QEKF1CM-106	E CAPACITOR	10μF,16V
C609	QCYA1CK-104	CAPACITOR	0.1μF,16V
C612	QCYA1HK-102	CAPACITOR	0.001μF,50V
C615	QCYA1HK-103	CAPACITOR	0.01μF,50V
C617	QEKF1AM-336	E CAPACITOR	33μF,10V
C619	QETN0JM-228E	E CAPACITOR	2200μF,6.3V
C627	QCYA1HK-103	CAPACITOR	0.01μF,50V
C628	QEKF0JM-107	E CAPACITOR	100μF,6.3V
C630	QETA1CM-106	E CAPACITOR	10μF,16V
C631	QCYA1HK-103	CAPACITOR	0.01μF,50V
C636	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C751	QCFA1HZ-223	CAPACITOR,E226EG	0.022μF,50V
C752	QCYA1HK-472	CAPACITOR,E226EG	0.0047μF,50V
C753	QFV11HJ-104	F CAPACITOR,E226EG	0.1μF,50V
C754	QCYA1HJ-102	CAPACITOR,E226EG	0.001μF,50V
C755	QCYA1HK-472	CAPACITOR,E226EG	0.0047μF,50V
C756	QFV11HJ-104	F CAPACITOR,E226EG	0.1μF,50V
C757	QCYA1HJ-471	CAPACITOR,E226EG	470pF,50V
⚠ C801	QFZ9022-333	F CAPACITOR,E226EG	0.033μF
⚠	QFZ9022-683	F CAPACITOR,J220E J221E	0.068μF
⚠ C802	QFZ9022-683	F CAPACITOR,J220E J221E	0.068μF
⚠ C803	QFZ9022-333	F CAPACITOR	0.033μF
C806	QETC1HM-225	E CAPACITOR	2.2μF,50V
C808	QFV11HJ-104AZ	F CAPACITOR	0.1μF,50V
C810	PECA0738-686	E CAPACITOR	
⚠ C811	QCZ9026-222	CAPACITOR	0.0022μF
⚠ C814	QCZ9026-101	CAPACITOR,J220E J221E	100pF
C815	QFLA1HJ-123Z	F CAPACITOR	0.012μF,50V
C816	QCBB1HJ-121	CAPACITOR	120pF,50V
C817	QCZ0212-472	CAPACITOR	0.0047μF,1kV
C851	QEMR1AM-107	E CAPACITOR	100μF,10V
C853	QEM91AM-687	E CAPACITOR	680μF,10V
C854	QEM91CM-827	E CAPACITOR	820μF,16V
C855	QEMR1EM-187	E CAPACITOR	180μF,25V
C856	QFLC1HJ-152Z	F CAPACITOR	0.0015μF,50V
C857	QFLC1HJ-332Z	F CAPACITOR	0.0033μF,50V
C859	QETC1HM-226	E CAPACITOR	22μF,50V
C860	QETC1HM-226	E CAPACITOR	22μF,50V
C861	QFLC1HJ-103Z	F CAPACITOR	0.01μF,50V
C862	QFLC1HJ-102Z	F CAPACITOR	0.001μF,50V
C863	QETC0JM-107	E CAPACITOR	100μF,6.3V
C864	QETC0JM-226	E CAPACITOR	22μF,6.3V
C866	QETC1CM-106	E CAPACITOR	10μF,16V
C868	QETC1CM-476	E CAPACITOR	47μF,16V
C869	QETC1HM-474	E CAPACITOR	0.47μF,50V
C870	QETC1CM-107	E CAPACITOR	100μF,16V
C901	QETF1CM-336	E CAPACITOR	33μF,16V
C902	QCYA1HK-102	CAPACITOR	0.001μF,50V
C903	QETC1HM-106	E CAPACITOR	10μF,50V
C904	QCYA1HK-102	CAPACITOR	0.001μF,50V
C905	QCYA1HK-223	CAPACITOR	0.022μF,50V

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C906	QETF1HM-474	E CAPACITOR	0.47μF,50V
	C953	QCYA1HK-223	CAPACITOR	0.022μF,50V
	L202	PU59152-220J	COIL	22μH
	L203	PU59152-470J	COIL	47μH
	L204	PU59152-820J	COIL	82μH
	L205	PU59152-151J	COIL	150μH
	L206	PU59152-100J	COIL	10μH
	L207	PU59153-101K	COIL	100μH
	L208	PU48530-101J	COIL	100μH
	L209	PU59152-150J	COIL	15μH
	L210	PU48530-561J	COIL	560μH
	L213	PU48530-101K	COIL,J221E E226EG	100μH
	L281	PU59152-R22J	COIL	0.22μH
	L282	PU59152-R22J	COIL,E226EG	0.22μH
		PU59152-1R0J	COIL,J221E	1μH
	L283	PU59152-R22J	COIL,E226EG	0.22μH
		PU59152-1R0J	COIL,J221E	1μH
⚠	L284	PU59152-101J	COIL,J221E	100μH
	L401	PU59152-470J	COIL	47μH
	L501	PELN1036-241Y	FERRATE BEADS	
	L502	PELN1036-241Y	FERRATE BEADS	
	L503	PELN1068-102Y	FERRATE BEADS	
	L505	PELN1036-241Y	FERRATE BEADS	
	L506	PU59152-1R0J	COIL	1μH
	L507	PU59152-R56J	COIL,J221E E226EG	0.56μH
		PU59152-1R0J	COIL,J220E	1μH
	L603	PU48530-100K	COIL	10μH
	L851	PELN0687	COIL	
	L853	PELN0687	COIL	
	L901	PU59152-R22J	COIL	0.22μH
	L902	PU59152-R22J	COIL	0.22μH
	L981	PELN1036-241Y	FERRATE BEADS	
	EQ201	PELN0877	EQUALIZER	
⚠	CF601	PEVB0594-Z	RESONATOR	
⚠	X201	PEVB0617	CRYSTAL RESONATOR	
⚠	X601	PEVB0422	CRYSTAL RESONATOR	
	SW501	PESW0671	SLIDE SWITCH,TEST SW J220E	
		PESW0672-02	SLIDE SWITCH,DEC/TEST J221E E226EG	
⚠	T1	PELN0832	OSC TRANSFORMER	
	K281	PU60281-5	FERRATE BEADS	
	K801	PELN0662-Z	FERRATE BEADS	
	K851	PELN0662-Z	FERRATE BEADS	
⚠	PC801	PC120FY9	PH COUPLER,E226EG	
⚠		PS2561L-1(WL)	PH COUPLER,J220E J221E	
	PS601	PU61433	REEL SENSOR	
	PS602	PU61433	REEL SENSOR	
⚠	T801	PELN1065	SW TRANS,J220E J221E	
⚠		PELN1097	SW TRANS,E226EG	
	T901	PELN0806	COIL	
	BKT1	PQ35314A-1	TRANS BRACKET ASSEMBLY	
	ETH1	PQ21623-1-2	EARTH PLATE(RF),TUNER	
	ETH2	PQ46451	EARTH PLATE,REGULATER	
	OTH1	PQ46408-1-2	SENSOR CAP,X2	
⚠	HS1	PQ45788-1-1	HEAT SINK	
	SCW1	SDSF3008Z	SCREW,TERMINAL BOARD J221E E226EG	
		SDSF3010Z	SCREW,TERMINAL BOARD J220E	
	SCW2	SDST3006Z	SCREW,HEAT SINK E226EG	
	SLD1	PQ46449	SHIELD CASE(CCD	
	SPC1	PEME0947-01-01	SPACER,X2 MECHA	
	TB1	PQ35304C-5	TERMINAL BOARD ASSEMBLY	
⚠	FC801	PEMC0965-Z	FUSE CLIP,F801	
⚠	FC802	PEMC0965-Z	FUSE CLIP,F801	

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	JA501	PEMC1104	RGB21PIN SOCKET,AV1 IN/OUT	
⚠	LF801	PELN0885	LINE FILTER	
⚠	LF802	PELN0876	LINE FILTER	
	CN1	PU60727-7	CONNECTOR,(1-7)A/C HEAD	
	CN2	PU60727-2	CONNECTOR,(1-2)FE HEAD	
	CN201	PEMC1055-004	CONNECTOR,(8-11)PRE/REC	
	CN202	PEMC1055-008	CONNECTOR,(1-8)PRE/REC	
	CN402	PEMC1101-004	CONNECTOR,(1-4)DRUM MOTOR	
	CN501	PEMC1122-115	CONNECTOR,(1-15)TERMINAL J221E	
	CN502	PEMC1101-009	CONNECTOR,(1-9)SW/JACK E226EG	
	CN601	PEMC1077	CONNECTOR,(1-8)CAP MDA	
	CN602	PU61434-1-1	CONNECTOR,(1-5)ROTARY ENCODER	
	CN603	PU60727-2	CONNECTOR,(1-2)LOADING MOTOR	
	CN605	PU59555-7	CONNECTOR,(1-7)JOG/SHUTTLE E226EG	
	CN702	PEMC1101-011	CONNECTOR,(5-15)DISPLAY/SW	
	CN703	PEMC1119-002	PIN HEADER,BACK UP	
⚠	CN801	PU60250-2	CONNECTOR,AC-INPUT	
⚠	CP401	ICP-N15	CIRCUIT PROTECTOR	
⚠	CP601	ICP-N25	CIRCUIT PROTECTOR	
⚠	CP801	ICP-N20	CIRCUIT PROTECTOR	
⚠	CP802	ICP-N25	CIRCUIT PROTECTOR	
⚠	F801	QMF51E2-1R25J1	FUSE	T1.2A

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TERMINAL BOARD ASSEMBLY <06> (J221E/E226EG)

PWBA	PB10921C	TERM BOARD ASSEMBLY	
TB1	PQ35304E-5	TERMINAL BOARD ASSY	
R1	QRD161J-682	RESISTOR	6.8kΩ,1/6W
R2	QRD161J-682	RESISTOR	6.8kΩ,1/6W
R11	QRD161J-750	RESISTOR	75Ω,1/6W
R13	QRD161J-750	RESISTOR	75Ω,1/6W
C1	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C2	QCBB1HJ-471	CAPACITOR	470pF,50V
C3	QCBB1HJ-471	CAPACITOR	470pF,50V
L3	PU59152-1R0J	COIL	1μH
JA1	PEMC1019	RGB21PIN SOCKET	
SCW1	SDSF3008Z	SCREW,CN1 1PIN	
SCW2	SDSF3008Z	SCREW,X2 TERMINAL BOARD	
CN1	PEMC1123-215	CONNECTOR,(1-15)MAIN	

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AUDIO/CONTROL HEAD BOARD ASSY <12>

PWBA	PB40068A	A/CTL HEAD BOARD ASSEMBLY
CN1	PU60910-107	CONNECTOR,(1-7)MAIN

#△ REF No.	PART No.	PART NAME, DESCRIPTION	

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DISPLAY BOARD ASSEMBLY <28>

PWBA1	PB10919L1-01	DISPLAY BOARD ASSEMBLY,J220E	
	PB10919M1-01	DISPLAY BOARD ASSEMBLY,J221E	
	PB10941C1	DISPLAY BOARD ASSEMBLY,E226EG	
IC1	UPD16311GC(P)	IC	
	or UPD16311GC(K)	IC	
	or UPD16311GC(E)	IC	
IC2	GP1U581X	IR DETECT UNIT	
	or HC-377J	IR DETECT UNIT	
D1	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D2	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D3	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D4	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D5	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D6	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D8	1N4148M	DIODE,J221E E226EG	
	or 1SS132Y	DIODE,J221E E226EG	
D9	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D10	1N4148M	DIODE,NON-V-PLUS J220E J221E	
	or 1SS132	DIODE,NON-V-PLUS J220E J221E	
D11	RD4.7ES-T1B2	ZENER DIODE J220E J221E	
D12	SLR-342VR3F	LE DIODE,OPERATE J220E J221E	
D13	SLR-342DC3F	LE DIODE,REVIEW J220E J221E	
D32	1N4148M	DIODE,E226EG	
	or 1SS132Y	DIODE,E226EG	
D33	1N4148M	DIODE,E226EG	
	or 1SS132Y	DIODE,E226EG	
D34	1N4148M	DIODE,E226EG	
	or 1SS132Y	DIODE,E226EG	
R1	QRD161J-333	RESISTOR	33kΩ,1/6W
R2	QRD161J-333	RESISTOR	33kΩ,1/6W
R3	QRD161J-333	RESISTOR	33kΩ,1/6W
R4	QRD161J-333	RESISTOR	33kΩ,1/6W
R4 ◇	QRD161J-333	RESISTOR	33kΩ,1/6W
R5	QRD161J-472	RESISTOR	4.7kΩ,1/6W
R6	QRD161J-472	RESISTOR	4.7kΩ,1/6W
R7	QRD161J-102	RESISTOR,J220E J221E	1kΩ,1/6W
	QRD161J-103	RESISTOR,E226EG	10kΩ,1/6W
R8	QRD161J-563	RESISTOR	56kΩ,1/6W
R9	QRD161J-102	RESISTOR,E226EG	1kΩ,1/6W
	QRD161J-103	RESISTOR,J220E J221E	10kΩ,1/6W
R10	QRD161J-103	RESISTOR	10kΩ,1/6W
R11	QRD161J-331	RESISTOR,J220E J221E	330Ω,1/6W
R12	QRD161J-331	RESISTOR,J220E J221E	330Ω,1/6W
R13	QRD161J-333	RESISTOR,J220E J221E	33kΩ,1/6W
R15	QRD161J-103	RESISTOR,E226EG	10kΩ,1/6W
	QRD161J-472	RESISTOR,J220E J221E	4.7kΩ,1/6W
R16	QRD161J-151	RESISTOR,E226EG	150Ω,1/6W
	QRD161J-103	RESISTOR,J220E J221E	10kΩ,1/6W
R19	QRD161J-472	RESISTOR,E226EG	4.7kΩ,1/6W
R20	QRD161J-103	RESISTOR,E226EG	10kΩ,1/6W
RA1	QRB045J-333F	RESISTOR ARRAY	33kΩ,4W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C1	QETF0JM-336	E CAPACITOR	33μF,6.3V
C2	QCFB1HZ-104	CAPACITOR,J220E J221E	0.1μF,50V
C3	QEKF1HM-106	E CAPACITOR,E226EG	10μF,50V
	QETF1HM-106	E CAPACITOR,J220E J221E	10μF,50V
C4	QCSB1HJ-330	CAPACITOR	33pF,50V
C5	QCSB1HJ-330	CAPACITOR	33pF,50V
C6	QETF0JM-227	E CAPACITOR	220μF,6.3V
C7	QCVB1CM-103	CAPACITOR,E226EG	0.01μF,16V
C10	QCVB1CN-103	CAPACITOR,E226EG	0.01μF,16V
S5	PESW0525-02Z	TACT SWITCH,PAUSE	
S6	PESW0525-02Z	TACT SWITCH,REC/ITR	
S7	PESW0525-02Z	TACT SWITCH,PLAY	
S8	PESW0525-02Z	TACT SWITCH,STOP/EJECT	
S15	PESW0525-02Z	TACT SWITCH,STORE J220E J221E	
S16	PESW0525-02Z	TACT SWITCH,CH SEARCH J220E J221E	
S17	PESW0525-02Z	TACT SWITCH,S17/S25 C.RESET E226EG	
S19	PESW0525-02Z	TACT SWITCH,S19/S27 C MEMO E226EG	
S24	PESW0525-02Z	TACT SWITCH,S21/S24 REVIEW J220E J221E	
S39	PESW0525-02Z	TACT SWITCH,FF J220E J221E	
S40	PESW0525-02Z	TACT SWITCH,REW J220E J221E	
FDP1	PEDP0098-04	FLUORESCENT DISPLAY PANEL	
HD1	PQM30038-6	LED HOLDER,FOR D12	
HD2	PQM30038-1-2	LED HOLDER,FOR D13	
HD3	PQ34668	FDP HOLDER(L)	
HD4	PQ34669	FDP HOLDER(R)	
CN1	PEMC1101-111	CONNECTOR,(3-13)MAIN	
CN2	PEMC0724-006	CONNECTOR,(1-6)SW/JACK J220E J221E	
	PEMC0889-013	CONNECTOR,(1-13)SW/JACK E226EG	

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REC SAFETY BOARD ASSEMBLY <32>

PWBA3	PB10941A3	REC SAFETY BOARD ASSEMBLY,E226EG
	PB10919A3-01	REC SAFETY BOARD ASSEMBLY,J220E J221E
S41	PESW0589	PUSH SWITCH

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CASS SW BOARD ASSEMBLY <33>

PWBA4	PB10941A4	CASS SW BOARD ASSEMBLY,E226EG
	PB10919A4-02	CASS SW BOARD ASSEMBLY,J221E
S42	PU61320	PUSH SWITCH,J220E J221E

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SWITCH/JACK BOARD ASSEMBLY <36>

PWBA2	PB10919C2-01	SW/JACK BOARD ASSEMBLY,J220E
	PB10941C2-01	SW/JACK BOARD ASSEMBLY,E226EG
	PB10919D2-01	SW/JACK BOARD ASSEMBLY,J221E
D13	SLR-342DC3F	LE DIODE,REVIEW E226EG

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
D14	SLR-342VC3F	LE DIODE,OPERATE E226EG	
D36	1SS133	DIODE,E226EG	
	or MA165	DIODE,E226EG	
	or 1N4148M	DIODE,E226EG	
D37	1SS133	DIODE,E226EG	
	or 1N4148M	DIODE,E226EG	
	or MA165	DIODE,E226EG	
R11	QRD161J-331	RESISTOR,E226EG	330Ω,1/6W
R14	QRD161J-331	RESISTOR,E226EG	330Ω,1/6W
R17	QRD161J-750	RESISTOR,E226EG	75Ω,1/6W
C9	QCBB1HJ-561	CAPACITOR,E226EG	560pF,50V
S1	PESW0525-02Z	TACT SWITCH,S1/S2 CH+	
S2	PESW0525-02Z	TACT SWITCH,S2/S14 CH-	
S3	PESW0525-02Z	TACT SWITCH,OPERATE	
S4	PESW0525-02Z	TACT SWITCH,TIMER	
S15	PESW0525-02Z	TACT SWITCH,STORE	
S16	PESW0525-02Z	TACT SWITCH,S13/S16 CH SET E226EG	
S18	PESW0525-02Z	TACT SWITCH,S18/S20 DISPLAY E226EG	
S24	PESW0525-02Z	TACT SWITCH,REVIEW E226EG	
HD2	PQM30038-2-2	LED HOLDER,D13	
HD3	PQM30038-6	LED HOLDER,D14	
JA1	PEMC1063-03	PIN JACK(SW),AUDIO E226EG	
JA2	PEMC1063-04	PIN JACK(SW),VIDEO E226EG	
J1	PW30101-60AA442	PARALLEL WIRE,REC SF	
J2	PW30101-60AA442	PARALLEL WIRE,CASS SW	
CN3	PEMC0723-006	CONNECTOR,(1-6)DISPLAY	
	PEMC0825-013	CONNECTOR,(1-13)DISPLAY/SW E226EG	
CN4	PEMC1101-109	CONNECTOR,(1-9)MAIN E226EG	

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PRE/REC AMP BOARD ASSEMBLY <43>

PWBA	PB10926B-01	PRE/REC BOARD ASSEMBLY	
IC101	BA7182AS	IC	
Q1	2SC4081(QRS)	TRANSISTOR	
Q2	2SA1576(QRS)	TRANSISTOR	
Q3	2SC4081(QRS)	TRANSISTOR	
Q4	2SC4081(QRS)	TRANSISTOR	
R1	NRSA63J-332N	RESISTOR	3.3kΩ,1/16W
R2	NRSA63J-681N	RESISTOR	680Ω,1/16W
R3	QRD161J-102	RESISTOR	1kΩ,1/6W
R4	NRSA63J-681N	RESISTOR	680Ω,1/16W
R12	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R13	NRSA63J-392N	RESISTOR	3.9kΩ,1/16W
R14	NRSA63J-392N	RESISTOR	3.9kΩ,1/16W
R15	NRSA63J-391N	RESISTOR	390Ω,1/16W
R16	NRSA63J-391N	RESISTOR	390Ω,1/16W
R17	NRSA63J-681N	RESISTOR	680Ω,1/16W
R18	NRSA63J-272N	RESISTOR	2.7kΩ,1/16W
R19	NRSA63J-122N	RESISTOR	1.2kΩ,1/16W
R20	NRSA63J-122N	RESISTOR	1.2kΩ,1/16W
R21	NRSA63J-102N	RESISTOR	1kΩ,1/16W
R22	NRSA63J-331N	RESISTOR	330Ω,1/16W
R24	QRSA08J-561YN	RESISTOR	560Ω,1/10W
R27	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R101	NRSA63J-103N	RESISTOR	10kΩ,1/16W
R102	NRSA63J-103N	RESISTOR	10kΩ,1/16W
R103	NRSA63J-363N	RESISTOR	36kΩ,1/16W

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
C1	NCF31HZ-103A	CAPACITOR	0.01μF,50V
C2	NCF31HZ-103A	CAPACITOR	0.01μF,50V
C9	NCS31HJ-330A	CAPACITOR	33pF,50V
C10	NCS31HJ-300A	CAPACITOR	30pF,50V
C11	NCF31HZ-103A	CAPACITOR	0.01μF,50V
C12	NCS31HJ-100A	CAPACITOR	10pF,50V
C15	NCB31HK-102A	CAPACITOR	0.001μF,50V
C31	QEKF0JM-476	E CAPACITOR	47μF,6.3V
C32	NCB31EK-103A	CAPACITOR	0.01μF,25V
C37	NCS31HJ-220A	CAPACITOR	22pF,50V
C39	NCS31HJ-2R0A	CAPACITOR	2pF,50V
C44	NCB31CK-104A	CAPACITOR	0.1μF,16V
C101	NCB31CK-104A	CAPACITOR	0.1μF,16V
C102	QCVB1CN-103	CAPACITOR	0.01μF,16V
C103	NCS31HJ-680A	CAPACITOR	68pF,50V
C104	NCB31CK-104A	CAPACITOR	0.1μF,16V
C105	NCB31CK-104A	CAPACITOR	0.1μF,16V
C106	NCB31CK-104A	CAPACITOR	0.1μF,16V
C107	QCYA1EK-104	CAPACITOR	0.1μF,25V
C108	QCYA1EK-104	CAPACITOR	0.1μF,25V
C109	QCYA1EK-104	CAPACITOR	0.1μF,25V
C110	NCS31HJ-390A	CAPACITOR	39pF,50V
C111	QEK60JM-476	E CAPACITOR	47μF,6.3V
C112	QCYA1HK-103	CAPACITOR	0.01μF,50V
L3	PU59152-560J	COIL	56μH
L4	PU59152-330J	COIL	33μH
L6	PU59152-560J	COIL	56μH
L101	PU48530-101J	COIL	100μH
BKT1	PQ21741-1-2	SHIELD FRAME,PRE	
CN1	PU59973-4	CONNECTOR,(1-4) UPPER DRUM	
CN2	PEMC1056-104	CONNECTOR,(8-11) MAIN	
CN3	PEMC1056-108	CONNECTOR,(1-8) MAIN	

SECTION 6
TECHNICAL INFORMATION

6.1 SYSCON CIRCUIT

6.1.1 Syscon CPU pin function (IC601) 1/2

PIN NO.	LABEL	IN/OUT	NOTE
1	S.CURVE	IN	TUNING CHECK
2	AVRGFM	IN	AUTO TRACKING DATA(AVERAGE VOLTAGE OF PB FM LEVEL)INPUT
3	P.DOWN	IN	POWER DOWN DETECT(POWER DOWN:H → L)
4	6.5H DET	IN	PB SWITCHING POINT ADJUST PULSE
5	AVSS	-	GND
6	TEST	-	GND
7	X2	-	TIMER CLOCK(32.768KHz)
8	X1	-	TIMER CLOCK(32.768KHz)
9	VSS	-	GND
10	OSC1	IN	SYSTEM CLOCK(10MHz)
11	OSC2	OUT	SYSTEM CLOCK(10MHz)
12	RESET	IN	RESET AT CONNECT VCR TO AC
13	(NMI)	-	NC
14	LSC	IN	MECHANISM MODE DETECT(C)
15	LSB	IN	MECHANISM MODE DETECT(B)
16	LSA	IN	MECHANISM MODE DETECT(A)
17	C.L.END	IN	CASSETTE TAPE LOAD SWITCH(CASSETTE IN: L)
18	RECSF	IN	REC SAFETY SW DETECT (SW ON:L)
19	STTS	IN	LEADER TAPE DETECT(DETECT ON:L)
20	PERI2	OUT	PERI-2 CONNECTOR SELECT
21	P.CTL	OUT	POWER CONTROL(POWER ON:H)
22	TU FG	IN	TAKE-UP REEL ROTATION DET/TAPE REMAIN
23	SUP FG	IN	SUPPLY REEL ROTATION DET/TAPE REMAIN
24	A.MUTE	OUT	AUDIO MUTE CONTROL(MUTE ON:H)
25	SHUTTLE	IN	SHUTTLE SWITCH
26	JSB	IN	JOG PULSE INPUT(B)
27	JSA	IN	JOG PULSE INPUT(A)
28	SERVO	OUT	CAPSTAN MOTOR CONTROL(SERVO:L/SYSCON:H)
29	LOCK DET	IN	TUNING LOCK CHECK
30	PLL CE	OUT	TUNING CONTROL CHIP ENABLE
31	RECST	OUT	REC START:H
32	PLL DATA	OUT	TUNING CONTROL SERIAL DATA OUTPUT
33	TUCTL	OUT	TUNER MODE:H
34	RAE OUT	OUT	REMOTE PAUSE CONTROL OUTPUT
35	P.MUTE	OUT	PICTURE MUTE CONTROL(MUTE ON:L)
36	HSEL	OUT	HEAD SELECT CONTROL(SP:L/LP:M/EP:H)
37	A/M/S	OUT	PRE/REC CIRCUIT CONTROL(AUTO:M/MANUAL:H/S&S:L)
38	V.REC	OUT	VIDEO REC MODE:H
39	R.PAUSE	IN	REMOTE PAUSE CONTROL(PAUSE ON:L)
40	M.DATA	IN/OUT	MEMORY IC DATA

Table 6-1-1-A SYSCON CPU pin function (1/2)

6.1.2 Syscon CPU pin function (IC601) 2/2

PIN NO.	LABEL	IN/OUT	NOTE
41	M.CE	OUT	MOMORY IC CHIP ENABLE
42	SCR-IN	-	NC
43	VP-SCL	OUT	VPS DATA TRANSFER CLOCK
44	VP-SDA	OUT	VPS SERIAL DATA OUTPUT(for PROGRAMING CONTROL)
45	VPCTL	OUT	V.PULSE ADDITION TIMING CONTROL
46	MODE 1/DAV	-	NC
47	MODE 2	-	NC
48	EXP DATA	OUT	EXPANDER DATA
49	ENDS	IN	TRAILER TAPE DETECT(DETECT ON:L)
50	RC IN	IN	REMOTE CONTROL DATA INPUT
51	EE	OUT	EE MODE:L
52	CTL C/D	IN	CTL PULSE INPUT(MODE DETECT/BLANK PORTION DET)
53	NTSC	OUT	NTSC MODE:L
54	CH+ DATA	OUT	IIL LOGIC CTL DATA
55	PB SPE	OUT	SPECIAL PB MODE:L
56	COM CLOCK	OUT	MEMORY IC DATA TRANSFER CLOCK
57	S-OUT	OUT	ON SCREEN CONTROL DATA
58	S-IN	IN	ON SCREEN/FDP CONTROL DATA
59	S-CLK	OUT	DATA TRANSFER CLOCK
60	H DATA	OUT	VIDEO IC CONTROL DATA
61	STB	OUT	CLOCK OUTPUT PERMISSION
62	H CLK	OUT	VIDEO IC DATA TRANSFER CLOCK
63	VCC	-	SYSTEM POWER
64	CAP REV	OUT	CAPSTAN MOTOR CONTROL (FWD:H/REV:L)
65	S-DATA	OUT	SERVO IC CONTROL DATA
66	PAUSE	OUT	CAPSTAN MOTOR CONTROL(PAUSE:L)
67	CTL CLOCK	IN	INDEX CONTROL
68	LCM2	OUT	LOADING MOTOR DRIVE(2)
69	CAP FG	IN	TAPE SPEED DETECT/BACK SPACE COUNT
70	LCM1	OUT	LOADING MOTOR DRIVE(1)
71	D.FF	IN	DRUM ROTATION DETECT/REC TIMING CONTROL
72	AVCC	-	SYSTEM POWER(for ANALOG)
73	AV2/CH+	IN	AV2 SELECT SWITCH
74	DUTY I/O	IN/OUT	IN/OUT INDEX DATA CONTROL
75	DRUM V	OUT	DRUM MOTOR CONTROL
76	CAP V	OUT	CAPSTAN MOTOR CONTROL
77	D.V.DET	IN	DRUM DRIVE VOLTAGE DETECT
78	PROTECT	IN	SWD5V/12V DETECT
79	IF AGC	-	NC
80	SYNC DET	IN	SYNC DETECT(NO SYNC:H)

Table 6-1-1-B SYSCON CPU pin function (2/2) E. & O. E. No. 82475

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